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ABSTRACT

Stonecutter Mills, Inc., is a textile manufacturing company with a major production facility in Spindale, North Carolina. In the past few years, Stonecutter Mills employees have been given an opportunity to spend up to 2 hours a week on company time to participate in PLATO-supported learning at Isothermal Community College. Employees could choose to participate in PLATO curricula to improve specific technical skills associated with their jobs at the mill, improve their performance on General Educational Development (GED) testing, or improve specific reading, writing, and mathematics skills needed to pass the Comprehensive Adult Student Assessment System (CASAS) performance levels identified for their job areas at the mill. Approximately 140 different employees have used the PLATO system in this arrangement to date. This evaluation provided a detailed profile of PLATO use within this unique learning environment. The data collected during this evaluation included the PLATO data file for March 1995 through September 1997 as well as interviews with one of the program coordinators/instructors. Analyses of the data indicate that the average amount of time spent per curriculum was very high, as were the average number of tries for mastery. Almost every learner completing each module and course also mastered the module/course master tests. Suggestions for followup investigations are included. (Contains 76 figures and 20 tables.) (SLD)

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PLATO®
Evaluation Series

Stonecutter Mills, Inc.
Isothermal Community College

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Executive Summary

Stonecutter Mills, Inc. is a textile manufacturing company with a major production facility located in the town of Spindale, North Carolina. Throughout the past few years, Stonecutter Mills employees have been given an opportunity to spend up to two hours per week on company time to participate in PLATO-supported learning at Isothermal Community College. Employees could choose to participate in PLATO curricula to improve specific technical skills associated with their jobs at the mill, improve their performance on GED testing, or improve specific reading, writing and math skills needed to pass the Comprehensive Adult Student Assessment System (CASAS) performance levels identified for their job areas at the mill.

Approximately 140 different employees have used the PLATO system in this arrangement to date. PLATO was selected because it offered the ability to comprehensively assess employee needs and provide individualized curricula to meet these needs, it appeared to support the development of skills related to many of the CASAS competencies, and the complementary technical programs also provided opportunities for certain employees to enhance very specific work-related skills.

This evaluation provides a detailed profile of PLATO use within this unique learning environment. The data collected during this evaluation included the PLATO CMI data file (March, 1995-September, 1997) as well as interviews with one of the program coordinators/instructors. Analyses of the data indicate that the average amount of time spent per curricula was very high, as were the average number of tries for mastery. And almost every learner completing each module and course also mastered the module/course mastery tests.

Suggestions for follow-up investigations are included.

Stonecutter Mills, Inc.-Isothermal Community College

Introduction

The Great Smoky Mountain foothills region in Western North Carolina is home to a variety of cultures in the United States with long, proud traditions of high quality textile manufacturing. And situated within this area is Stonecutter Mills, Inc., a manufacturing operation specializing in custom yarn and fabric weaving, dying and finishing. One of Stonecutter Mills' major production facilities is located in the town of Spindale, North Carolina. During the past few years, Stonecutter Mills has cultivated a partnership with one of the community colleges located in Spindale to provide some of its employees with an opportunity to improve basic math and reading skills as well as specialized manufacturing skills, including those associate with such technical areas as blueprint reading and hydraulic-pneumatic operations. Since 1995, various PLATO curricula have been implemented through Isothermal Community College (ICC) in Spindale to help meet some of the needs of Stonecutter Mills employees. The purpose of this evaluation is to provide a profile of PLATO use within this unique learning environment. The data collected during this evaluation included the PLATO CMI data file (March, 1995-September, 1997) as well as interviews with one of the program coordinators/instructors, Randy Greene (contact information: Randy Greene, P.O. Box 365. Mill Spring, NC 28756)

Description of the Program

The standard PLATO curricula as well as the complementary workplace and technical curricula were purchased by Stonecutter Mills, Inc. and installed in a computer lab on the campus of Isothermal Community College in 1995. This relationship between Stonecutters Mill and Isothermal typifies their partnership, with employees from the mill given an opportunity, on company time, to improve specific work-related skills and, if desired, work toward a high school diploma. PLATO was selected because it offered the ability to comprehensively assess employee needs and provide individualized curricula to meet these needs. In addition, the curricula and coursework were well-suited to address many of the skill deficiencies identified in the Comprehensive Adult Student Assessment System (CASAS) implemented at Stonecutters Mill. The complementary technical programs also provided opportunities for certain employees to enhance very specific work-related skills.

Throughout the past few years, Stonecutter Mills employees have been given an opportunity to spend up to two hours per week on company time to participate in PLATO supported learning at Isothermal Community College in an effort to improve their basic reading, writing and math skills as well as particular technical skills associated with their jobs at the mill. To this date, approximately 140 different employees have used the PLATO system in this arrangement. All the participants have been 18 years old or older, with educational backgrounds ranging from illiterate high school drop-outs to college graduates. Learner ethnicity included White non-Hispanic, African American, and Pacific Island, with both males and females represented. Their

reasons for participation in the PLATO curricula included the improvement basic and technical skills necessary to pass the CASAS performance levels identified for their job area at the mill, personal growth, and/or a desire to earn a GED.

In an effort to ensure that all members of the diverse workforce at Stonecutter Mills possess basic skill competencies deemed minimal for adequate job performance, the Comprehensive Adult Student Assessment System (CASAS) has been administered to most employees, with specific minimum scores for different skill levels assigned to different departments. Most of the program participants have chosen to take advantage of the PLATO opportunity at Isothermal Community College because specific basic skill deficiencies were identified from their CASAS performance. Based on these results, instructors managing Stonecutter Mills' use of technology at ICC assigned individual learners specific PLATO curricula to begin with. The overall goal for most of these employees was to test out of the minimum CASAS competencies for their specific departments at the mill.

Although the procedures followed by each employee participating the PLATO program varied somewhat, a number of common elements have been established. At any given time, approximately 15 Stonecutter Mills employees actively use the PLATO material throughout a typical week. These employees are released from work for one hour, two days per week. The average participant has used PLATO eight hours per month for about six months. Participation in the PLATO program has been strictly voluntary; however, employees from the same departments are encouraged to participate at different times to prevent too many employees from the same department

leaving work at the same time. Many employees have participated in goal-directed groups, including groups of employees desiring a GED, groups involved in specific employment qualification test preparation, and groups needing to pass similar CASAS competencies. In addition, some employees have participated simply to improve their own computer and other technology-related skills. Although the company pays for employees to spend two hours per week at ICC, they are free to spend as much time as they please on their own.

Program coordinators from both ICC and Stonecutter Mills work with three ICC instructors to manage the PLATO implementation. These instructors work in ICC's computer lab most of the time in which employees are released from work. Individual learning paths are developed through personal interest as well as CASAS assessment reports. Once specific curricula of interest are identified, individual learners use PLATO's diagnostic and prescription system for developing their own learning paths. Within these paths, learners can place out of modules by taking the mastery tests first. Instructors are on hand to help learners log onto the program as well as help them understand difficult subject material.

Evaluation Method

Most of this evaluation is based on learner performance within the PLATO system throughout a two and one-half year period from March, 1995 to September, 1997. The CMI data were analyzed to determine which PLATO curricula were used, how much time was spent within the individual courses and modules, and what

level(s) of mastery were achieved. In addition to the CMI data, interviews with one of the ICC instructors (also an employee of Stonecutter Mills) were conducted. Unfortunately, neither CASAS data nor individual learner survey information were accessible for this evaluation.

Results

Analyses of the CMI data indicate that at least 5 employees participated in the following PLATO curricula during the time period previously indicated:

Math Fundamentals (blm)

Pre-Algebra (alm)

Applied Math (jwml)

Reading 1 (blr)

Blueprint Reading (bpr)

Hydraulic Power Fundamentals (hydrm)

Pneumatic Power Fundamentals

In addition, a small number of employees also participated in Reading 2, Science Fundamentals, Communication, and Writing Series curricula. However, analyses of these data are not included in this report because most courses and modules in these curricula included data for only one or two learners.

The Pre-Algebra curriculum consists of four courses: alm1, alm2, alm3, and alm6. The data in Table 1 represents the number of learners starting each of the 7 modules constituting the course, the number completing each module, the mean time spent

within each, the mean number of times individual learners tried to complete each module, the number mastering each module assessment, and the percent of those completing the module who mastered the module assessment. Following this table are four graphs (Figures 1.1-1.4) which respectively display completion status (number starting but not completing and number completing by module), activity score (no score, mastered, not mastered by module), mean time per module, and mean number of tries per module. Tables 2-4 as well as Figures 2.1 – 4.4 report and disply the same data for the other courses in the Pre-Algebra curriculum.

The data displayed in Figure 5.1 summarize the completion status for each course in the Pre-Algebra curriculum. These data indicate that nine learners started course "alma1" and six completed it, five learners started course "alma2" and four completed it, two learners started course "alma3" and two completed it, and five learners started course "alma6 and three completed it. The data displayed in Figure 5.2 summarize the activity score by course. These data indicate that five learners mastered the "alma1" course assessment, four learners mastered the "alma2" course assessment, two learners mastered the "alma3" course assessment, and three learners mastered the "alma6" course assessment.

The data displayed in Figure 5.3 summarize the mean time per learners starting each course within the Pre-Algebra curriculum. These data indicate that learners spent an average 110.81 minutes working within course alm1, 624.50 minutes working with course alm2, 62.40 minutes within course alm3, and 122.67 minutes working within course alm6. The data displayed in Figure 5.4 summarize the mean number of tries

those learners starting each course within the Pre-Algebra curriculum tried to master individual modules within the course. These data indicate that learners tried an average 6.10 times in course, 26.5 tries per learner in course alm2, 1.6 tries per leaner in course alm3, and 9.28 tries per leaner within course alm6.

Tables 6-14 as well as Figures 6.1 to 14.4 summarize and display data related to each module within the nine courses constituting the Math Fundamentals curriculum (blm) in the same manner as the data displayed and summarized for the module and course data for the Pre-Algebra curriculum. The data displayed in Figure 15.1 represents the mean time (minutes) per course learners spent within the Math Fundamentals curriculum. These data values range from an average 106.40 minutes for course "blm1" to 590.92 minutes for course "blm6." The data represented in Figure 15.2 represents the mean number of tries per course in which learners attempted to master individual modules. These numbers range from 7.17 tries (blm1) to 23.45 tries (blm5). The completion status information for the entire curriculum is not included in any figures because only one measurement category ()mathfund_A) was recorded in the CMI file. The number of learners starting but not completing the curriculum were 19, while the number of learners completing the curriculum were 10. The number of learners mastering the curriculum were 10, representing 100% of the learners completing the curriculum.

Table 16 presents the course data by module for the Blueprint Reading ()bpr) course. Figures 16.1-16.3 present individual graphs displaying completion status, mean time, and mean number of tries per module. Course data are summarized at the bottom

of Table 16, indicating that 18 learners started the course and 16 completed it. Of the 16 learners completing the course, all 16 (100%).passed the course mastery assessment. The average amount of time spent working within the course was 368.06 minutes while the average number of tries was 13.22.

Table 17 presents the course data by module for the Hydraulic Power Fundamentals (hydrm) course. Figures 17.1-17.3 present individual graphs displaying completion status, mean time, and mean number of tries per module. Course data are summarized at the bottom of Table 17, indicating that 21 learners started the course and 15 completed it. Of the 15 learners completing the course, all 15 (100%).passed the course mastery assessment. The average amount of time spent working within the course was 973.38 minutes while the average number of tries was 39.63.

Table 18 presents the course data by module for Pneumatic Power Fundamentals course. Figures 18.1-18.4 present individual graphs displaying completion status, activity score, mean time, and mean number of tries per module. Course data are summarized at the bottom of Table 18, indicating that 19 learners started the course and 15 completed it. Of the 15 learners completing the course, all 15 (100%).passed the course mastery assessment. The average amount of time spent working within the course was 819.06 minutes while the average number of tries was 11.06.

Table 19 presents the course data by module for Applied Math ()wm1) course. Figures 19.1-19.4 present individual graphs displaying completion status, activity score, mean time, and mean number of tries per module. Course data are summarized at the bottom of Table 19, indicating that 16 learners started the course. No course completion

or mastery data were reported in the CMI file. The average amount of time spent working within the course was 362.88 minutes while the average number of tries was 13.00.

Table 20 presents the curriculum data by course (blra) for the Reading 1 curriculum. Figures 20.1-20.4 present individual graphs displaying completion status, activity score, mean time, and mean number of tries per module. Course data are summarized at the bottom of Table 20, indicating that 16 learners started the curriculum. No course completion or mastery data were reported in the CMI file. The average amount of time spent working within the curriculum was 687.63 minutes while the average number of tries was 12.19.

Brief Discussion

Perhaps the most significant finding reported in the data was the obvious tenacity of the learners participating in the PLATO program. The average amount of time spent per curricula was high, as were the average number of tries for mastery. And the fact that almost every learner completing each module and course also mastered the module/course mastery tests indicate that they were involved in each assigned activity from start to finish. There is little doubt that this commitment had a positive effect on the employees' subsequent CASAS performance.

The fact that many employees chose to enrich their skills related to the manufacturing industry was evident by the amount of participation in those courses specific to manufacturing (blueprints, hydraulics, pneumatics). The availability of these

types of computer-based learning experiences undoubtedly had a positive influence on the overall positive response to the PLATO product reported by Randy Greene. "I think it [PLATO] is a very comprehensive program, " commented Greene during an interview. "It really seems to be meeting the needs identified in the CASAS competencies."

The only limitation reported by Greene with the PLATO product as implemented at ICC was its inability to address the needs of the very low or non-readers.

The data reported in the tables represent very reliable series of calculations identifying the amount of time, number of tries, and completion/mastery information for each Stonecutter Mills employee participant. In order to determine any effects of the PLATO system on workplace performance, it will be necessary to examine employee CASAS performance before and after participation in the PLATO program.

Data Collection Term: March 1995 to September 1997

Curriculum: Pre-algebra (alm)

Table 1: "alm1" Course Data by Module

Module	N Started	# Completed	Mean Time	Mean Tries	# Mastered	% Mastered*
a	25	25	39.52 (41.36)	2.4 (2.5)	15	60%
b	7	5	61.00 (57.64)	2.2 (2.2)	4	80%
c	6	6	30.17 (15.43)	1.7 (1.0)	6	100%
d	6	4	20.75 (9.57)	1.8 (1.0))	4	100%
e	5	4	16.50 (10.15)	1.3 (0.5)	4	100%
f	5	4	174.50 (145.58)	5.3 (4.3)	4	100%
g	7	6	48.00 (49.96)	2.3 (1.75)	4	67%

Mean time (minutes) spent within all course modules: 110.81
Mean number of tries per course: 6.10

*The percent mastered represents the percentage of learners completing the module (or course) who mastered the module (or course) assessment.

Figure 1.1 :"alm1" Completion Status by Module

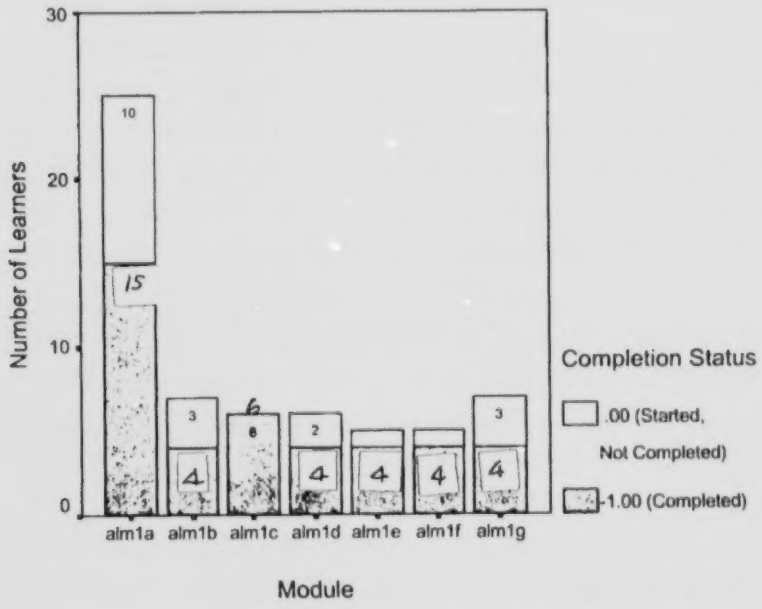


Figure 1.2: "alm1" Activity Score by Module

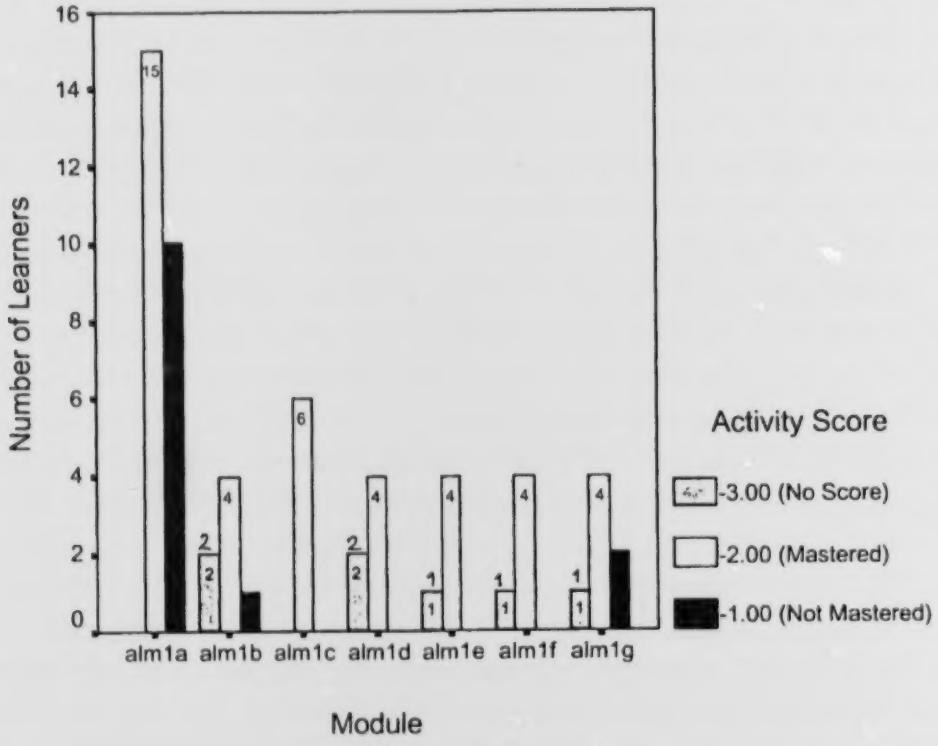


Figure 1.3: "alm1" Mean Time (Minutes) by Module

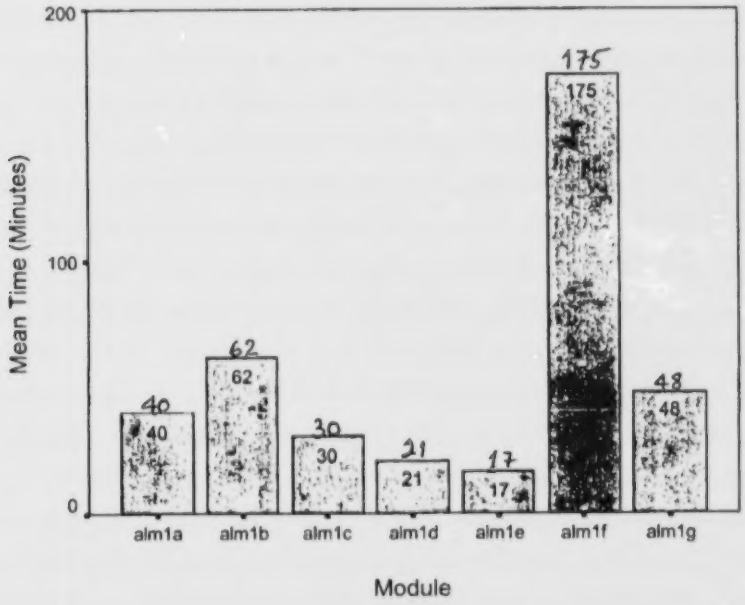


Figure 1.4: "alm1" Mean Tries per Module

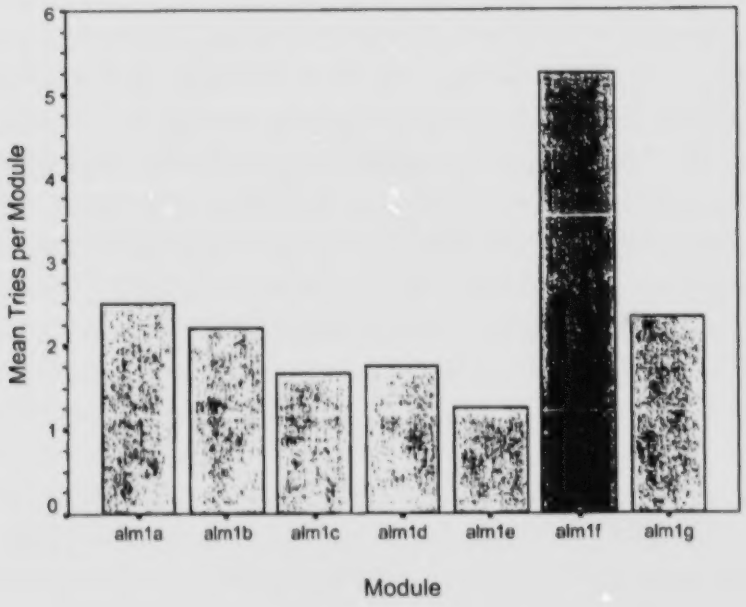


Table 2: "alm2" Course Data by Module

Module	N Started	# Completed	Mean Time	Mean Tries	# Mastered	% Mastered*
a	4	3	123.67 (88.69)	4.67 (2.89)	3	100%
b	4	3	86.67 34.78)	3.67 (1.53)	3	100%
c	4	4	126.25 (48.53)	4.00 (3.46)	4	100%
d	4	4	73.00 (27.77)	2.50 (1.73)	4	100%
e	4	4	61.25 (23.96)	4.50 (3.87)	4	100%
f	4	4	50.25 (20.52)	2.50 (2.38)	4	100%
g	4	4	156.00 (92.97)	6.75 (3.86)	4	100%

Mean time (minutes) spent within all course modules: 624.50
Mean number of tries per module: 26.5

Figure 2.1: "alm2" Completion Status by Module

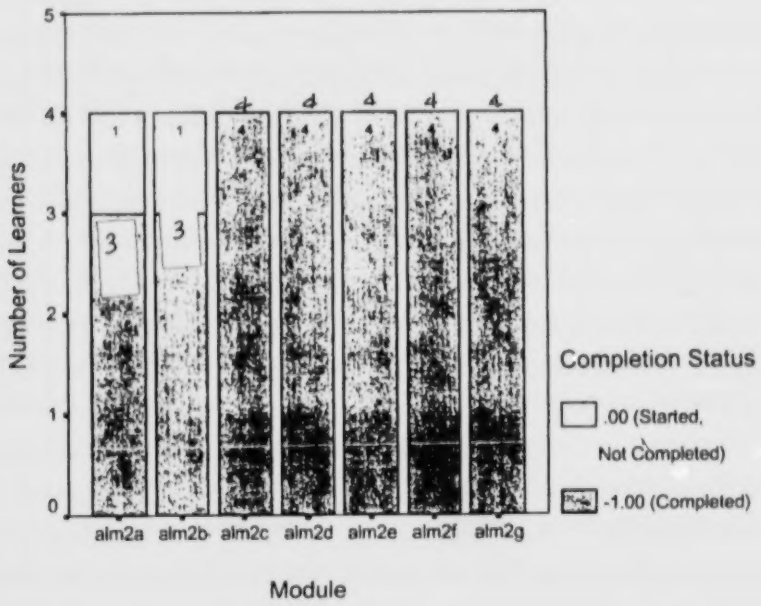


Figure 2.2: "alm2" Activity Score by Module

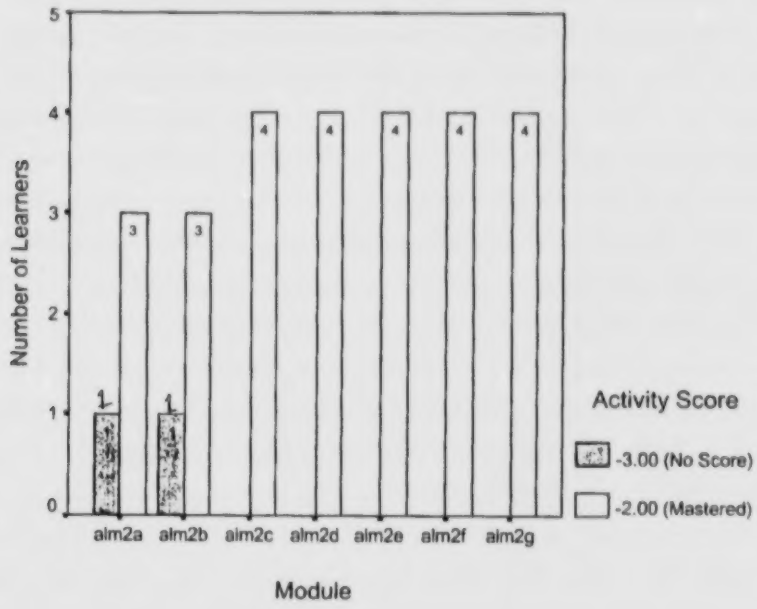


Figure 2.3: "alm2" Mean Time (Minutes) by Module

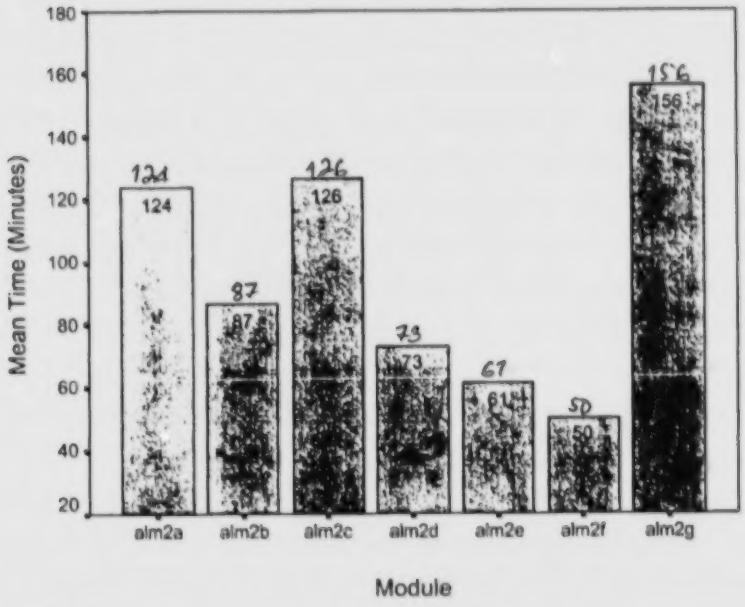


Figure 2.4: "alm2" Mean Number of Tries per Module

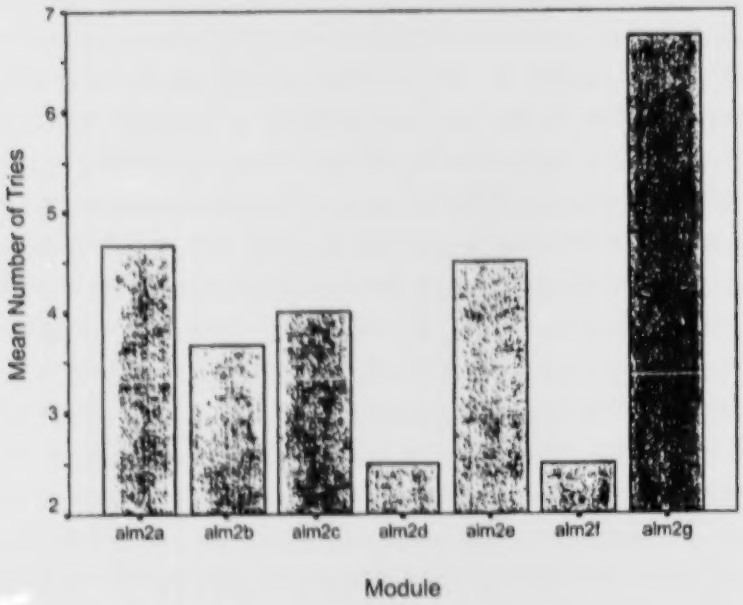


Table 3: "alm3" Course Data by Module

Module	N Started	# Completed	Mean Time	Mean Tries	# Mastered	% Mastered*
a	2	1	22.00	2	1	100%
b	2	1	9.00	1	1	100%
c	2	1	5.00	1	1	100%
d	2	1	26.00	1	1	100%

Mean time (minutes) spent within all course modules: 62.00
Mean number of tries per course: 1.6

Figure 3.1: "alm3" Completion Status by Module

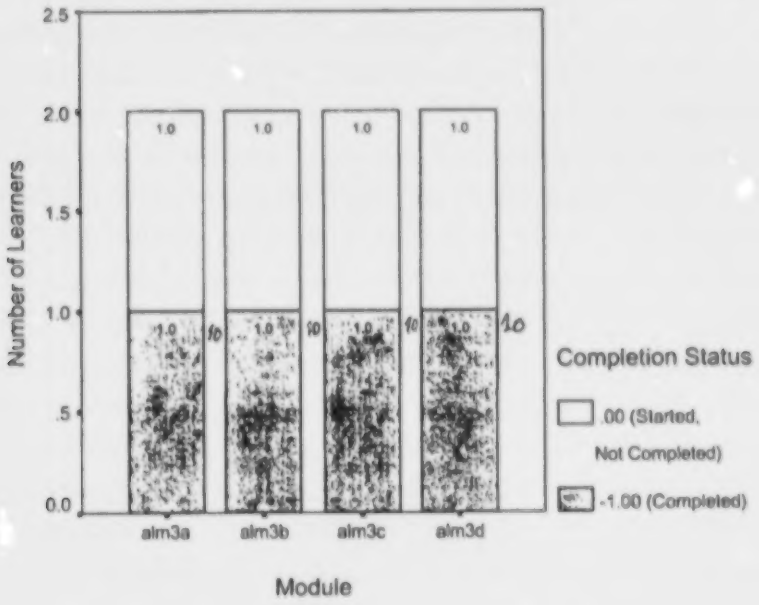


Figure 3.2: "alm3" Activity Score by Module

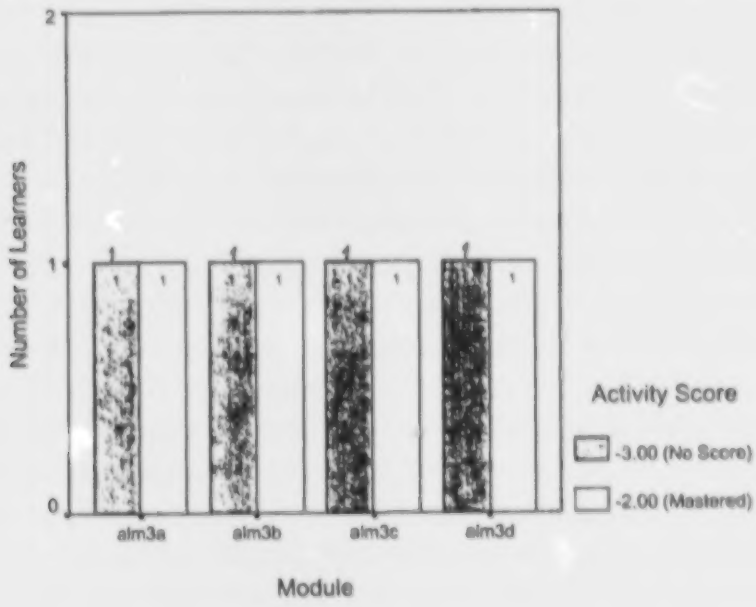


Figure 3.3: "alm3" Mean Time (Minutes) per Module

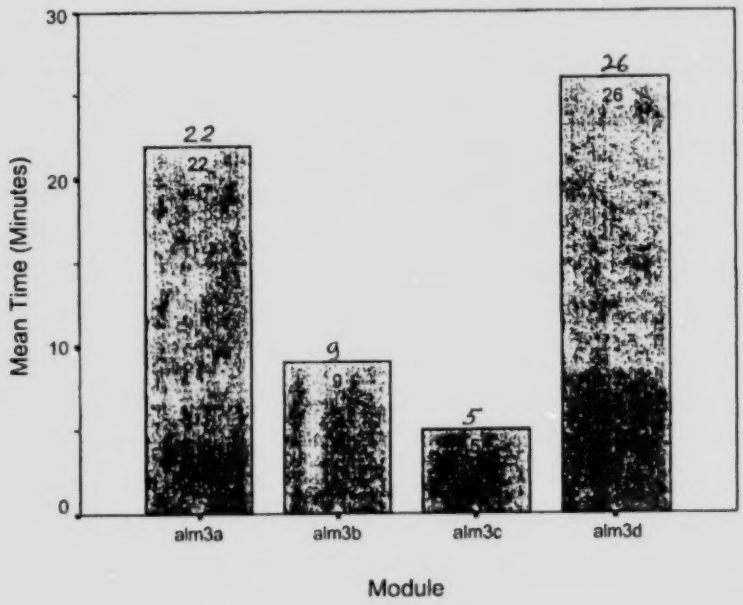


Figure 3.4: "alm3" Mean Number of Tries per Module

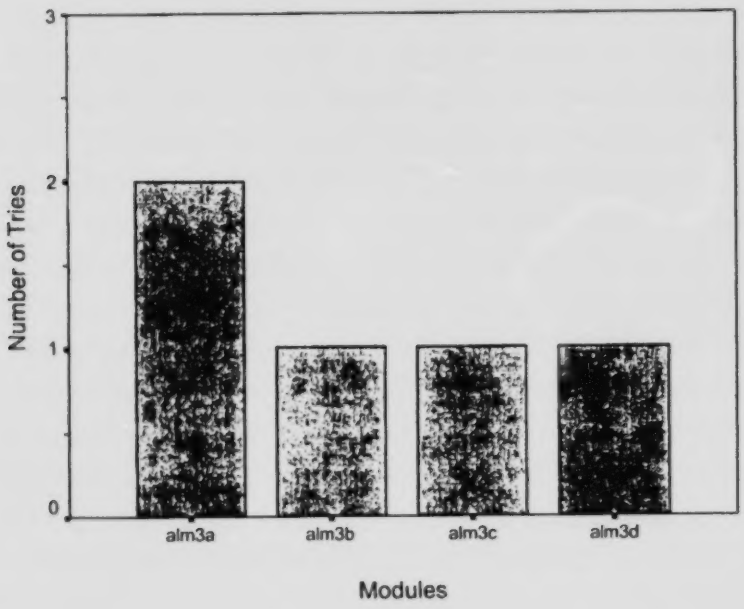


Table 4: "alm6" Course Data by Module

Module	N Started	# Completed	Mean Time	Mean Tries	# Mastered	% Mastered*
a	17	12	51.13 (36.71)	2.19 (1.33)	12	100%
b	12	12	36.55 (22.26)	1.73 (1.01)	12	100%
c	15	10	52.82 (81.53)	9.00 (2.91)	10	100%
d	5	3	38.00 (15.39)	1.67 (0.58)	3	100%
e	4	3	78.50 (40.30)	2.25 (1.89)	3	100%

Mean time (minutes) spent within all course modules: 122.67
Mean number of tries per course: 9.28

Figure 4.1: "alm6" Completion Status by Module

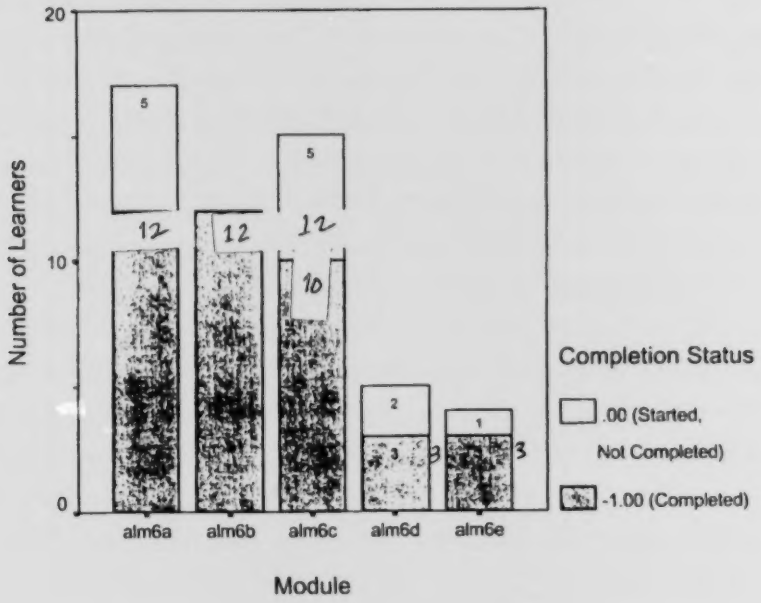


Figure 4.2: "alm6" Activity Score by Module

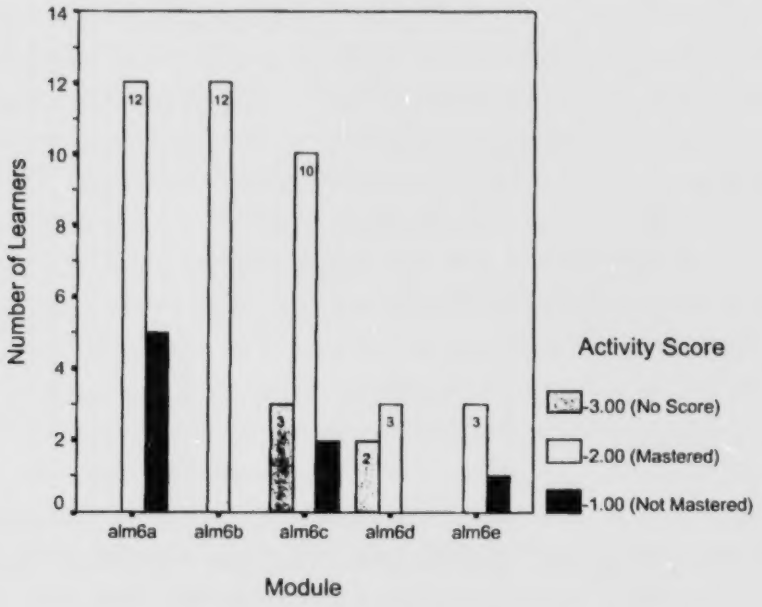


Figure 4.3: "alm6" mean Time (Minutes) per Module

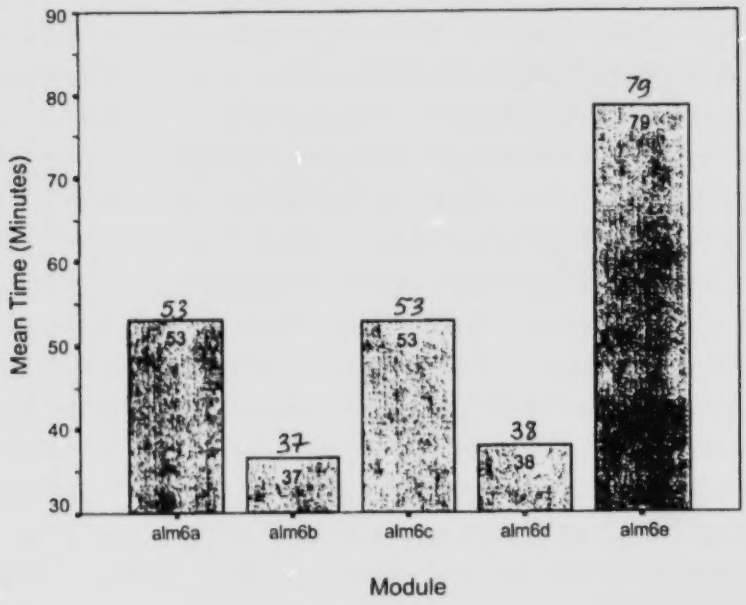


Figure 4.4: "alm6" Mean Number of Tries per Module

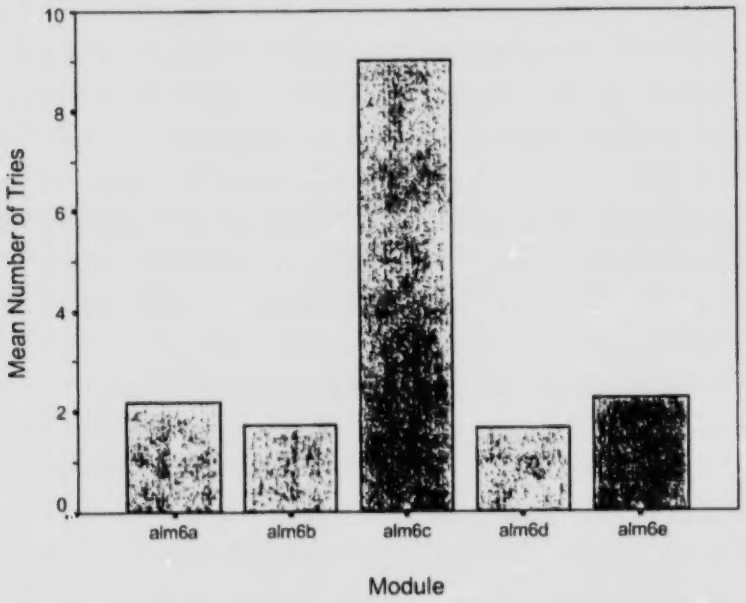


Figure 5.1: Pre-Algebra (alma) Completion Status by Course

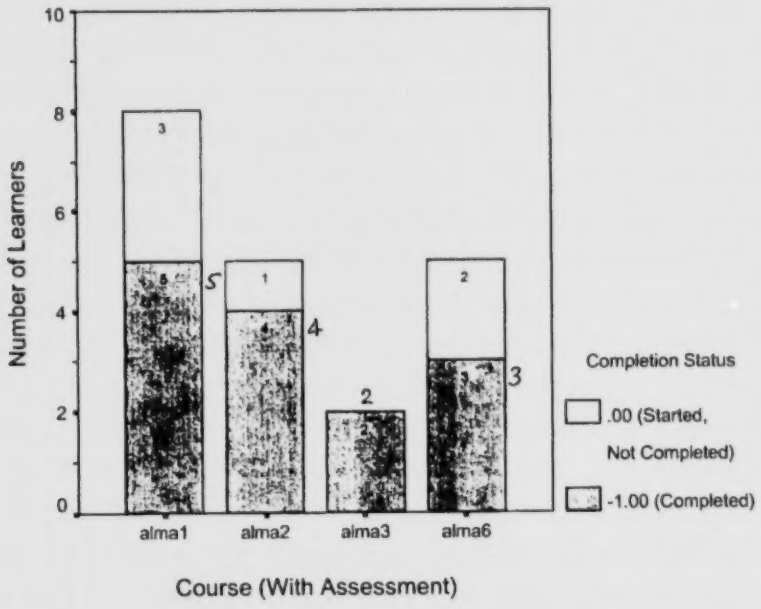


Figure 5.2: Pre-Algebra (alma) Activity Score by Course

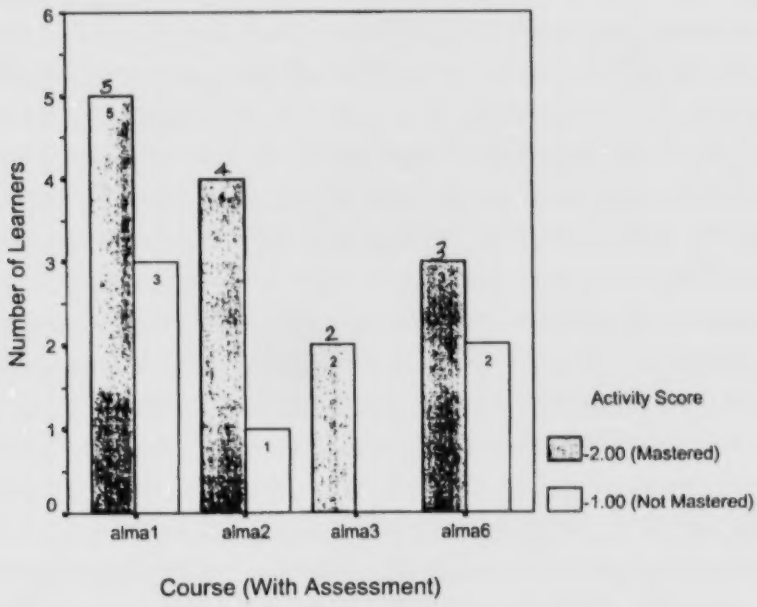


Figure 5.3: Pre-Algebra (alm) Mean Time (Minutes) per Course

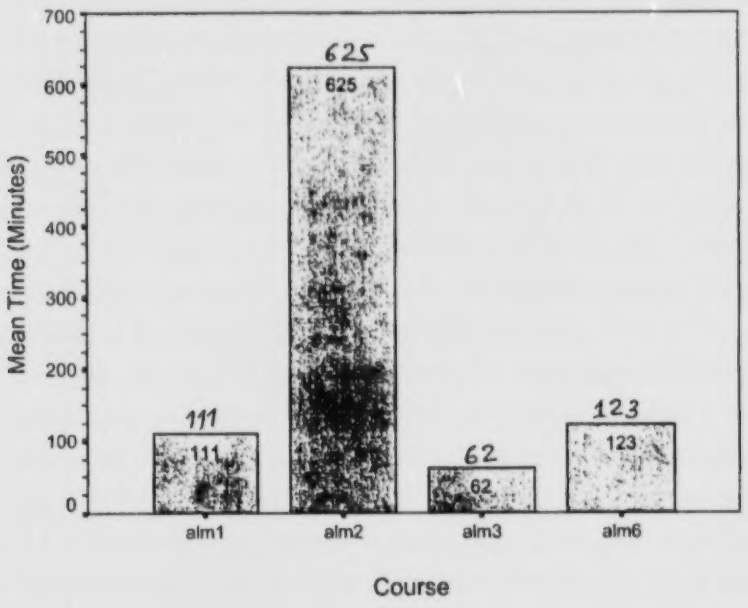
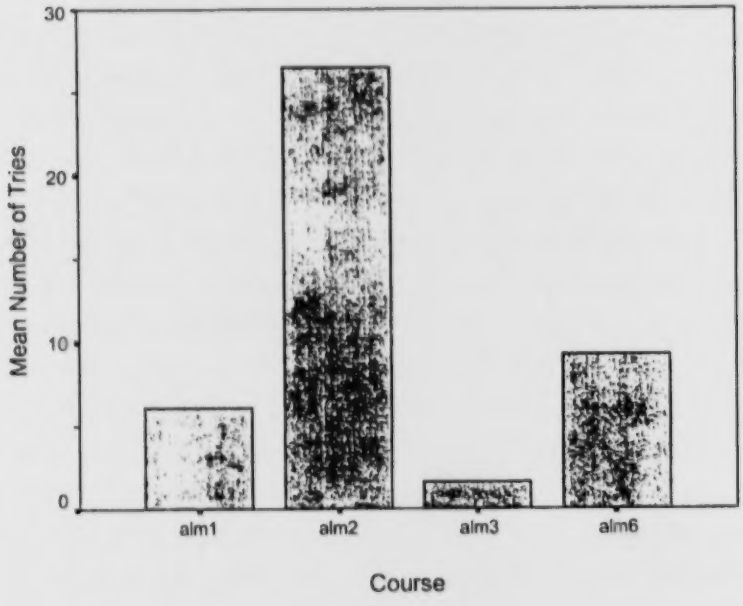


Figure 5.4: Pre-Algebra (alm) Mean Number of Tries per Course



Curriculum: Math Fundamentals (blm)

Table 6: "blm1" Course Data by Module

Module	N Started	# Completed	Mean Time	Mean Tries	# Mastered	% Mastered*
a	41	16	38.17 (32.33)	3.20 (2.86)	16	100%
b	32	12	15.00 (13.53)	1.42 (.67)	12	100%
c	17	12	17.00 (11.17)	1.53 (1.23)	12	100%
d	32	17	22.76 (22.61)	1.24 (.44)	17	100%
e	31	15	27.80 (22.88)	1.93 (1.22)	15	100%
f	8	7	21.86 (14.32)	1.43 (.79)	7	100%
g	29	13	63.67 (41.13)	3.42 (2.31)	13	100%
h	29	7	95.57 (70.01)	3.86 (2.79)	7	100%

Mean time (minutes) spent within all course modules: 106.4
Mean number of tries per course: 7.17

Figure 6.1: "blm1" Completion Status by Module

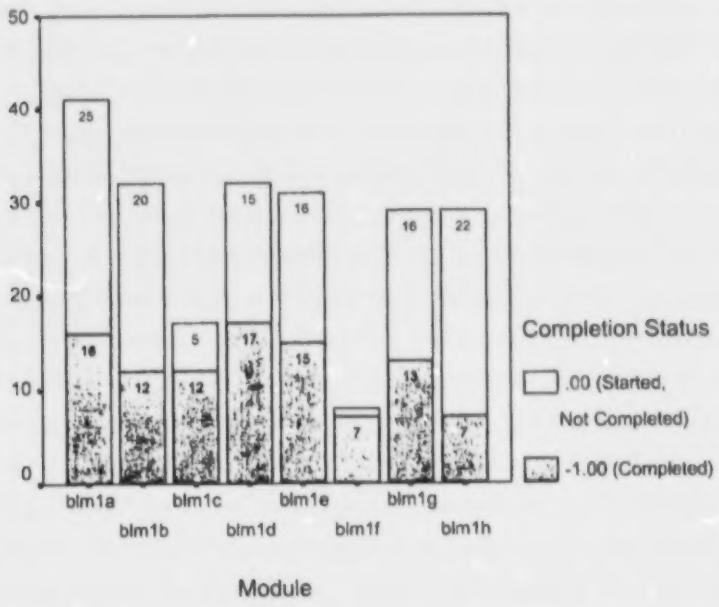


Figure 6.2: "blm1" Activity Score by Module

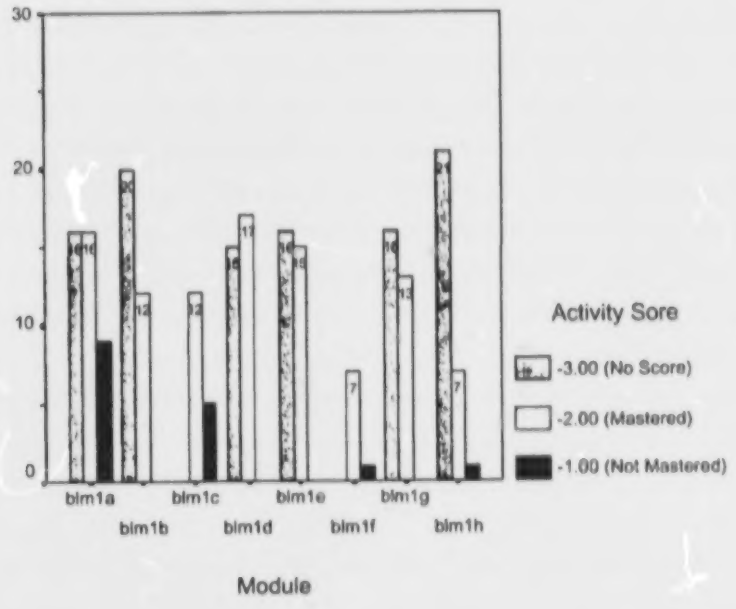


Figure 6.3: "blm1" Mean Time (Minutes) per Module

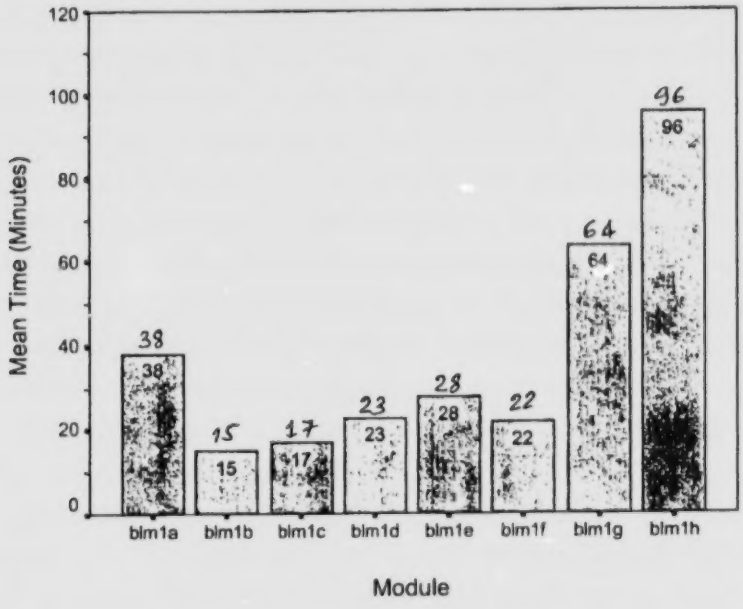


Figure 6.4: "blm1" Mean Number of Tries per Module

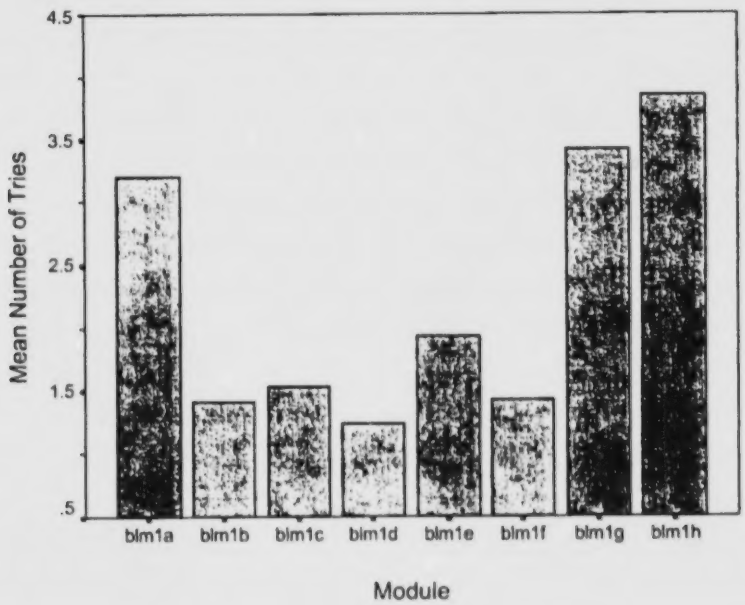


Table 7: "blm2" Course Data by Module

Module	N Started	# Completed	Mean Time	Mean Tries	# Mastered	% Mastered*
a	32	14	27.27 (30.97)	1.56 (1.09)	14	100%
b	32	19	27.45 (29.82)	1.65 (0.88)	19	100%
c	31	19	15.68 (16.71)	1.58 (1.17)	19	100%
d	30	27	36.68 (20.88)	2.18 (1.42)	27	100%
e	30	9	13.67 (10.05)	1.00 (.00)	9	100%
f	30	12	14.08 (13.79)	1.42 (0.67)	12	100%
g	29	13	8.38 (5.53)	1.15 (0.38)	13	100%
h	29	17	20.24 (17.27)	1.47 (0.87)	17	100%
i	14	13	31.50 (22.17)	1.86 (0.95)	13	100%

Mean time (minutes) spent within all course modules: 115.63
Mean number of tries per course: 8.03

Figure 7.1: "blm2" Completion Status by Module

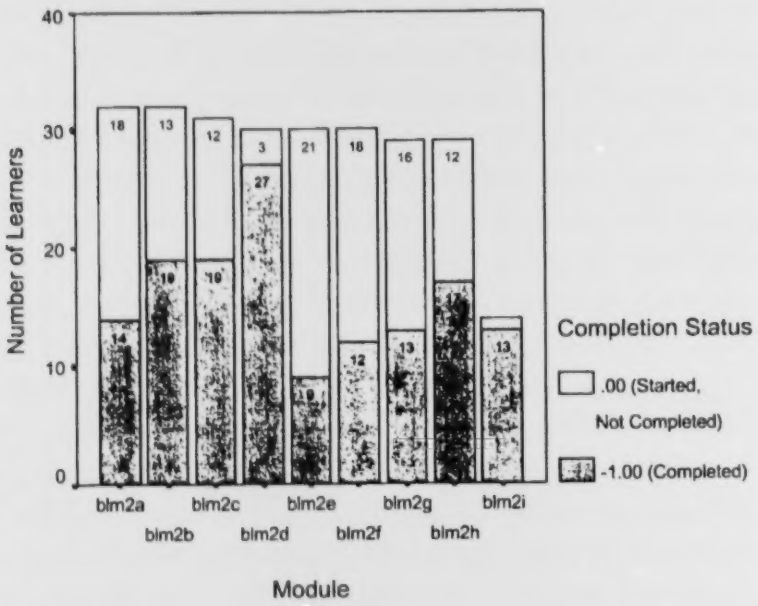


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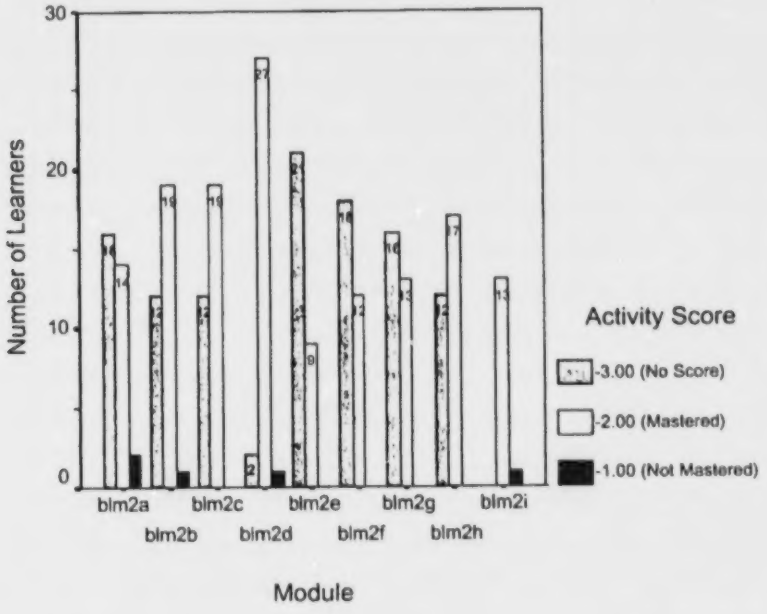
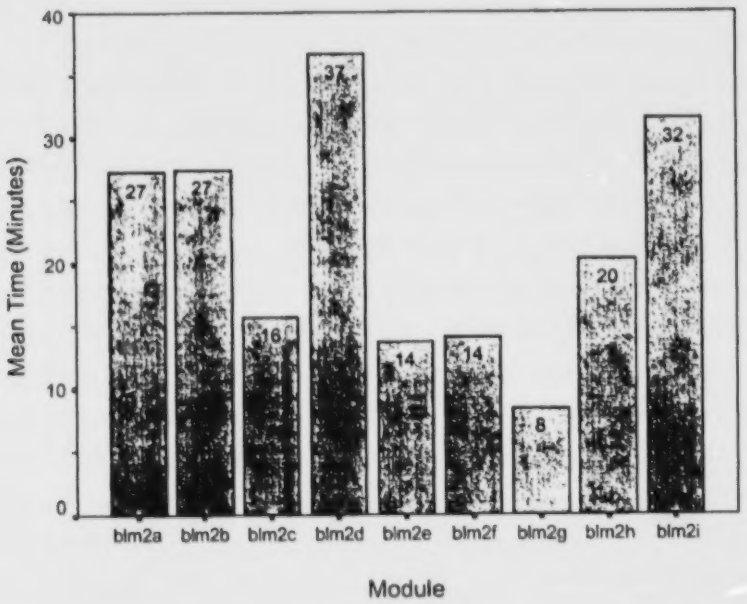
Figure 7.2: "blm2" Activity Score by Module



BEST COPY AVAILABLE

Figure 7.3: "blm2" Mean Time (Minutes) per Module



BEST COPY AVAILABLE

Figure 7.4: "blm2" Mean Number of Tries per Module

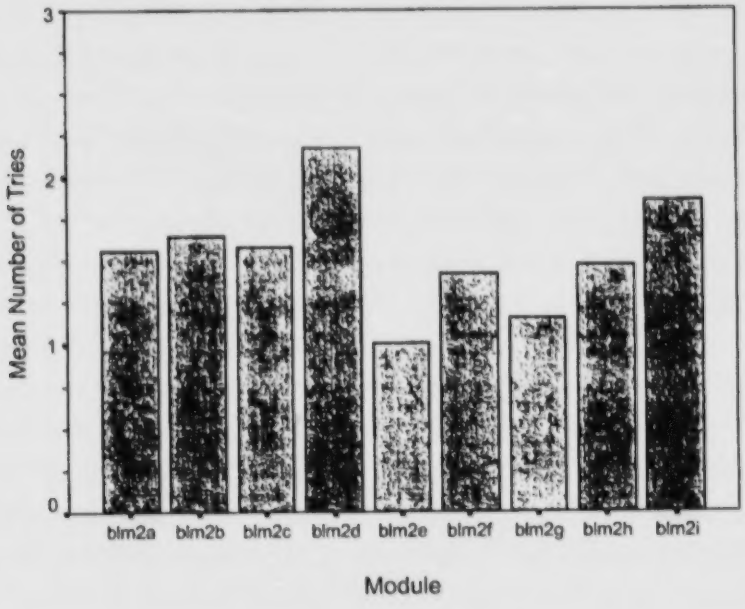
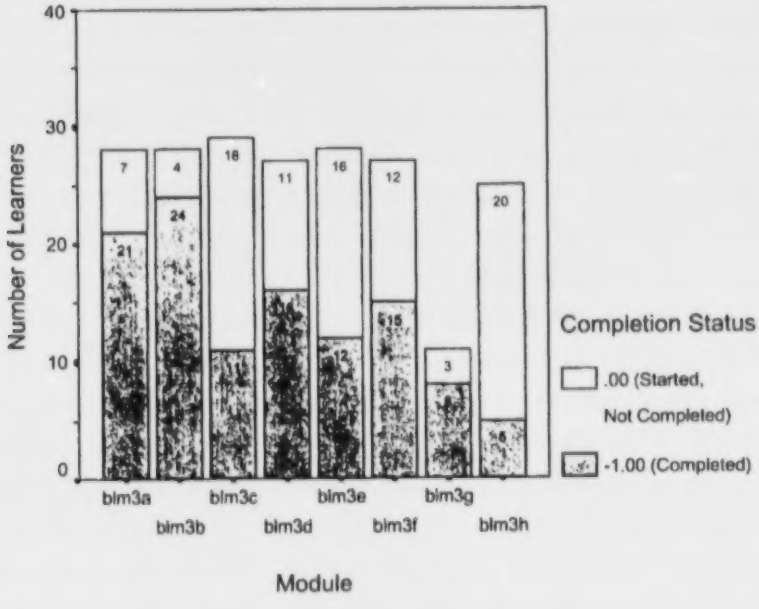


Table 8: "blm3" Course Data by Module

Module	N Started	# Completed	Mean Time	Mean Tries	# Mastered	% Mastered*
a	28	21	31.24 (31.01)	1.71 (0.85)	21	100%
b	28	24	19.58 (23.15)	1.54 (1.22)	24	100%
c	29	11	12.09 (12.77)	1.27 (0.65)	11	100%
d	27	16	29.75 (52.72)	1.81 (1.76)	16	100%
e	28	12	38.46 (59.44)	2.08 (1.61)	12	100%
f	27	15	50.27 (52.54)	2.47 (1.81)	15	100%
g	11	8	41.64 (32.51)	2.36 (1.03)	8	100%
h	25	5	129.75 (36.01)	3.80 (2.39)	5	100%

Mean time (minutes) spent within all course modules: 165.25
Mean number of tries per course: 9.38

Figure 8.1: "blm3" Completion Status by Module



BEST COPY AVAILABLE

Figure 8.2: "blm3" Activity Score by Module

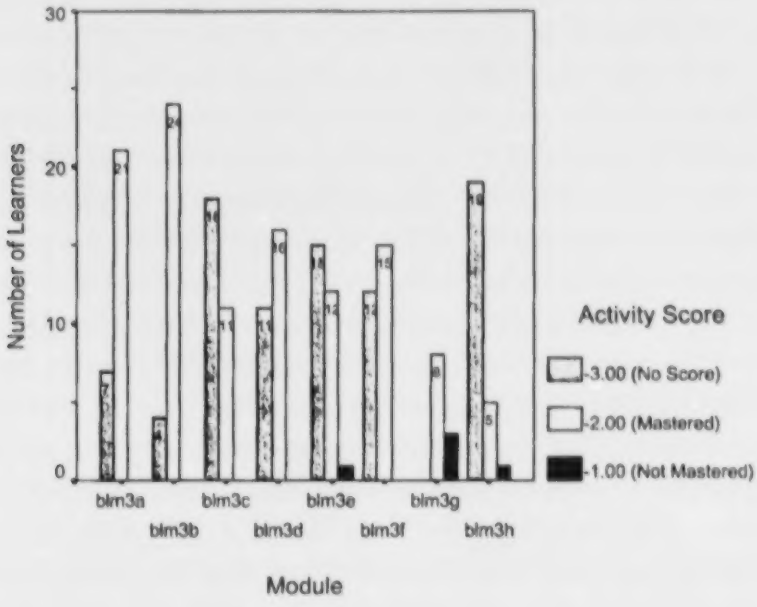


Figure 8.3: "blm3" Mean Time (Minutes) per Module

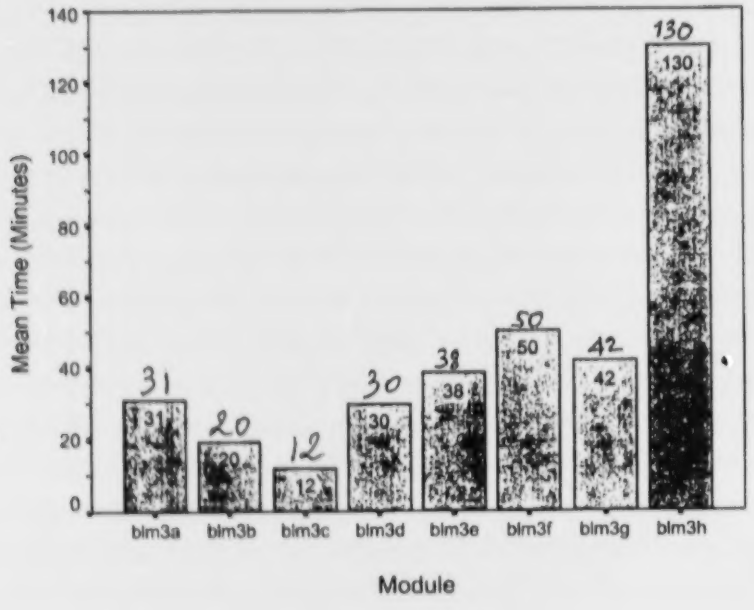


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Figure 8.4: "blm3" Mean Tries per Module

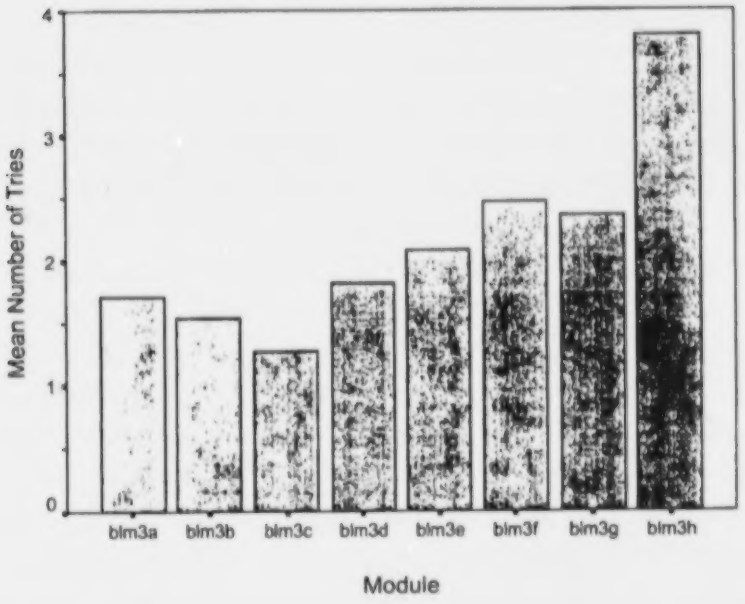

Table 9: "blm4" Course Data by Module

Module	N Started	# Completed	Mean Time	Mean Tries	# Mastered	% Mastered*
a	28	24	30.16 (20.63)	1.84 (0.80)	24	100%
b	28	16	22.18 (23.47)	1.47 (0.72)	16	100%
c	27	17	36.24 (34.00)	1.59 (0.87)	17	100%
d	27	22	42.04 (33.91)	2.39 (1.44)	22	100%
e	27	22	36.55 (20.98)	2.14 (1.08)	22	100%
f	27	11	20.91 (23.11)	1.25 (0.62)	11	100%
g	27	14	23.79 (15.73)	1.50 (0.65)	14	100%
h	27	12	21.77 (15.42)	1.54 (0.78)	12	100%
i	27	13	26.38 (18.47)	1.92 (1.66)	13	100%
j	16	14	14.13 (13.07)	1.56 (0.51)	14	100%
k	28	10	55.91 (45.04)	2.67 (2.93)	10	100%
l	27	16	38.71 (35.46)	1.88 (1.83)	16	100%
m	26	16	66.47 (40.15)	2.53 (1.62)	16	100%
n	14	11	34.54 (21.20)	1.57 (0.65)	11	100%
o	22	7	142.13	7.88	6	85.7%

	(176.81)	(7.36)

Mean time (minutes) spent within all course modules: 342.62
Mean number of tries per course: 19.15

Figure 9.1: "blm4" Completion Status by Module

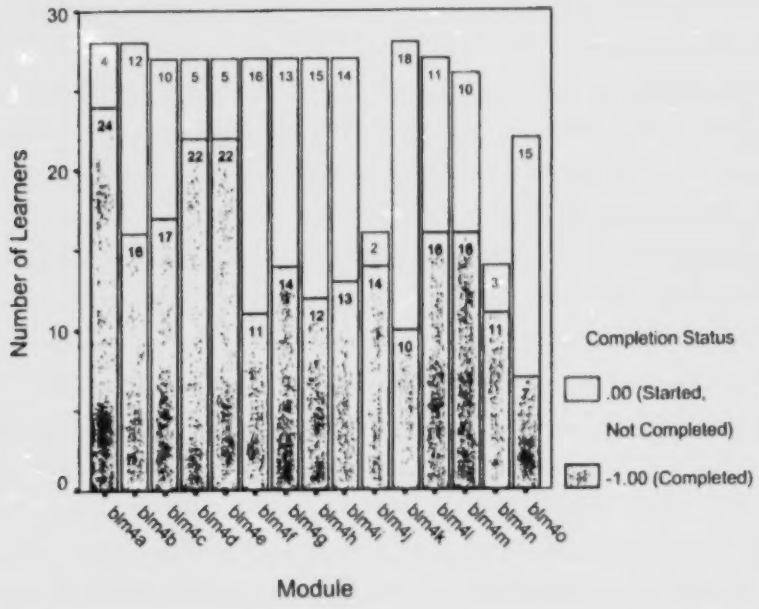

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Figure 9.2: "blm4" Activity Score by Module

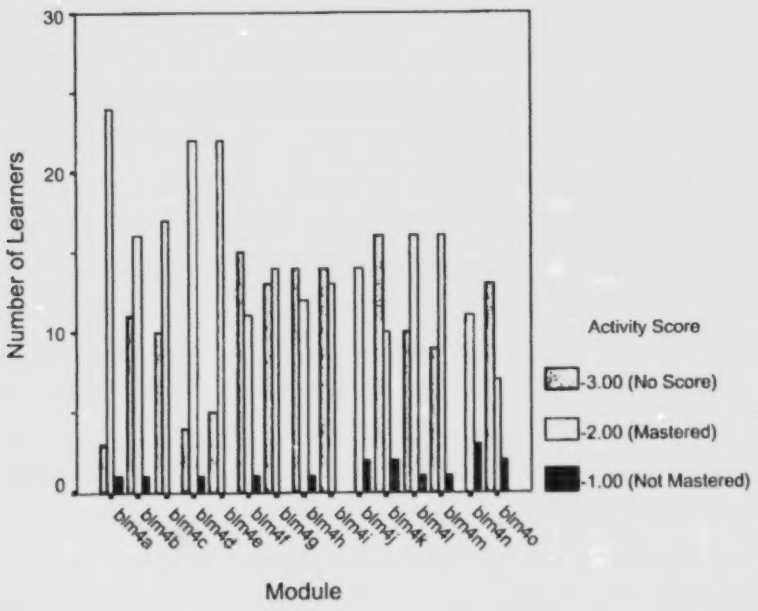

Figure 9.3: "blm4" Mean Time (Minutes) per Module

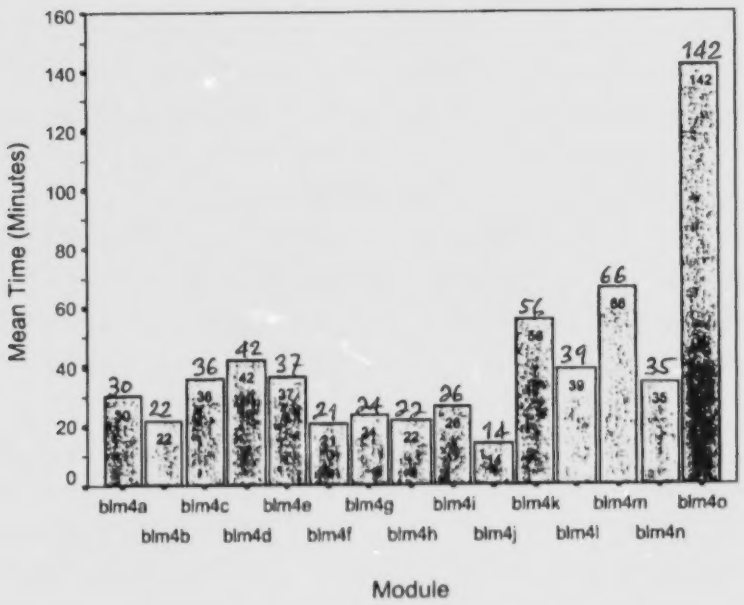

Figure 9.4: "blm4" Mean Number of Tries per Module

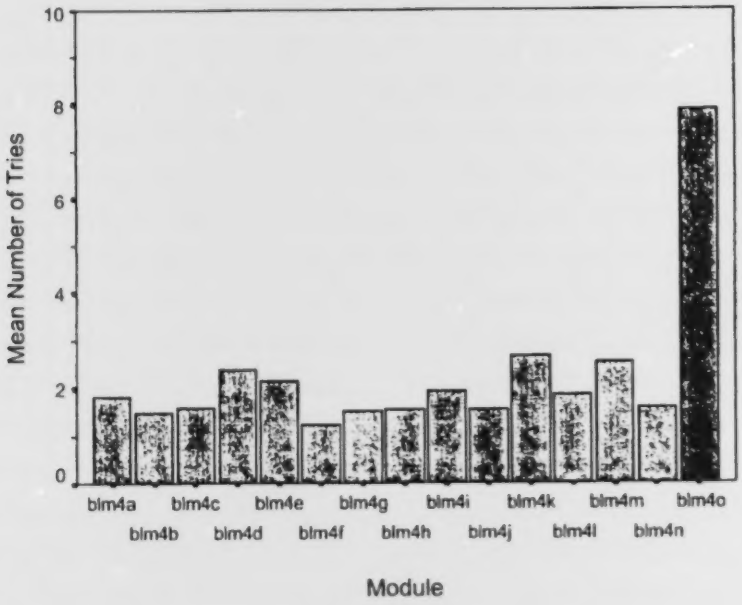

Table 10: "blm5" Course Data by Module

Module	N Started	# Completed	Mean Time	Mean Tries	# Mastered	% Mastered*
a	24	20	42.29 (32.60)	2.81 (2.68)	20	100%
b	23	16	30.35 (30.75)	1.71 (0.99)	16	100%
c	23	13	31.85 (19.66)	2.23 (1.17)	13	100%
d	22	15	31.40 (24.31)	1.80 (0.94)	15	100%
e	22	14	42.71 (45.81)	2.07 (1.44)	14	100%
f	10	9	17.33 (13.95)	1.50 (0.71)	9	100%
g	22	14	71.86 (54.81)	5.64 (10.74)	14	100%
h	22	15	20.93 (13.88)	1.27 (0.46)	15	100%
i	22	17	67.59 (45.42)	3.53 (3.47)	17	100%
j	22	14	72.57 (68.14)	2.50 (1.40)	14	100%
k	22	12	115.80 (93.32)	5.40 (8.31)	12	100%
l	8	7	74.57 (18.24)	2.75 (1.04)	7	100%
m	19	8	65.88 (51.72)	4.00 (3.02)	8	100%

Mean time (minutes) spent within all course modules: 423.36
Mean number of tries per course: 23.45

Figure 10.1: "blm5" Completion Status by Module

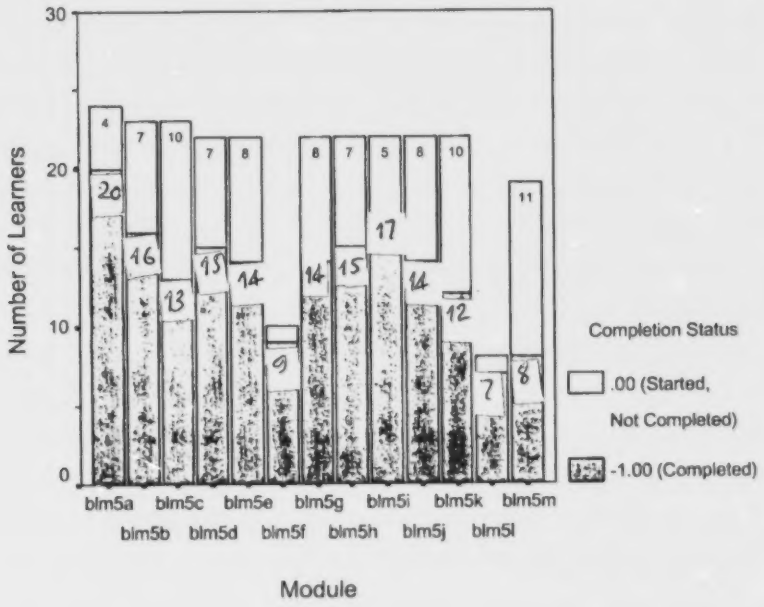

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Figure 10.2: "blm5" Activity Score by Module

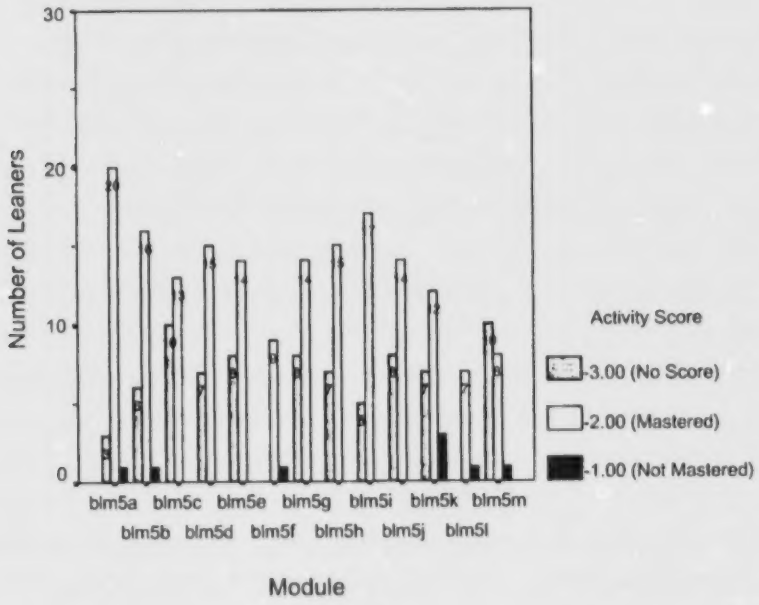

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Figure 10.3: "blm5" Mean Time (Minutes) per Module

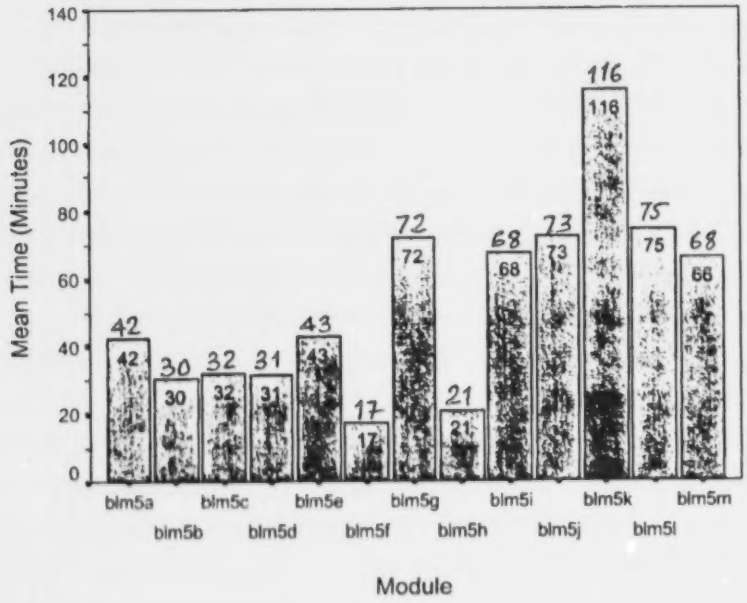

Figure 10.4: "blm5" Mean Number of Tries per Module

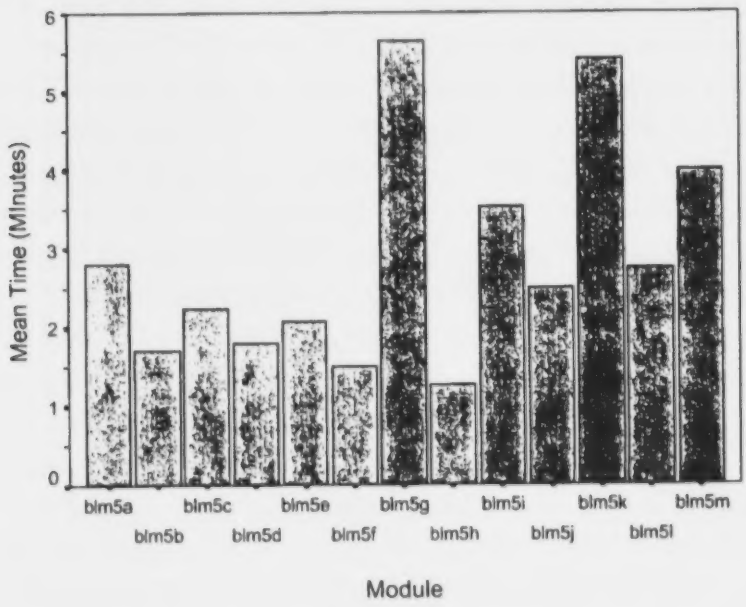

Table 11: "blm6" Course Data by Module

Module	N Started	# Completed	Mean Time	Mean Tries	# Mastered	% Mastered*
a	24	16	33.76 (20.36)	2.12 (1.58)	16	100%
b	22	18	64.60 (42.48)	2.80 (2.53)	18	100%
c	21	19	32.11 (19.27)	1.58 (0.51)	19	100%
d	21	17	85.65 (56.46)	2.95 (2.56)	17	100%
e	17	13	41.79 (25.61)	1.79 (0.80)	12	100%
f	11	10	35.18 (22.84)	1.45 (0.69)	10	100%
g	20	12	14.00 (10.77)	1.29 (0.47)	12	100%
h	18	15	88.20 (60.07)	2.80 (1.57)	15	100%
i	19	14	106.56 (86.01)	3.38 (2.45)	14	100%
j	18	14	76.38 (49.05)	3.13 (2.00)	14	100%
k	18	14	82.73 (46.89)	2.87 (3.04)	14	100%
l	8	8	44.57 (18.45)	1.57 (0.79)	8	100%
m	19	11	27.40 (23.34)	1.40 (0.52)	11	100%
n	17	15	16.00 (14.48)	1.14 (0.36)	15	100%
o	17	13	34.29	1.64	13	100%

| (19.18) (0.93)

p	16	12	96.64 (79.03)	3.79 (1.93)	12	100%
q	14	11	67.82 (82.32)	1.42 (0.67)	11	100%
r	7	6	33.83 (21.43)	1.50 (0.84)	6	100%
s	14	6	66.60 (39.05)	2.00 (1.00)	6	100%

Mean time (minutes) spent within all course modules: 590.92
Mean number of tries per course: 23.28

Figure 11.1: "blm6" Completion Status by Module

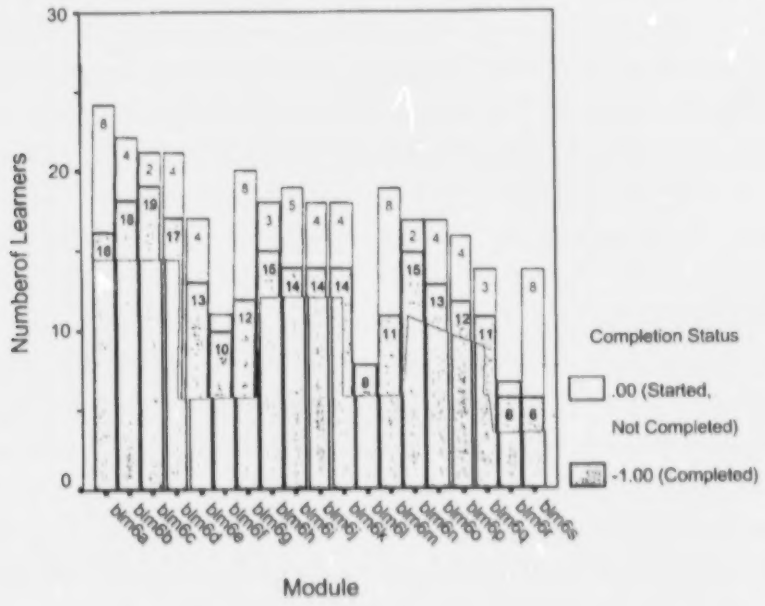

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Figure 11.2: "blm6" Activity Score by Module

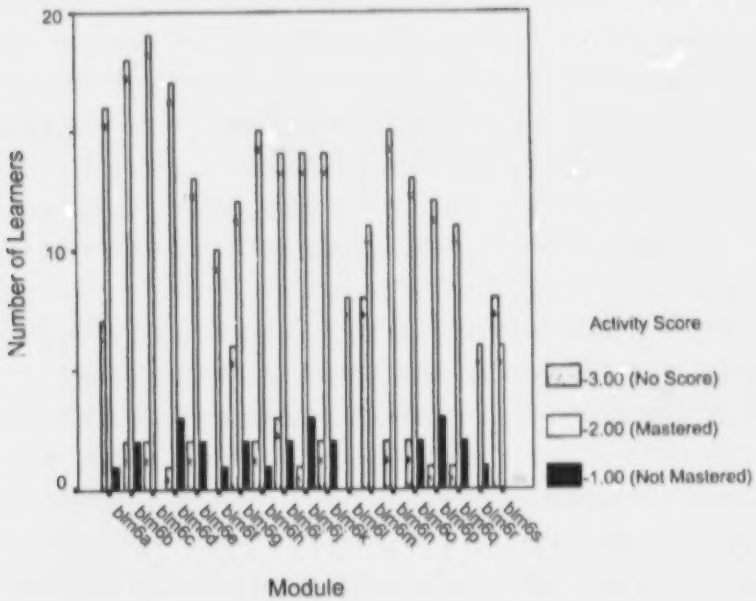

Figure 11.3: "blm6" Mean Time (Minutes) per Module

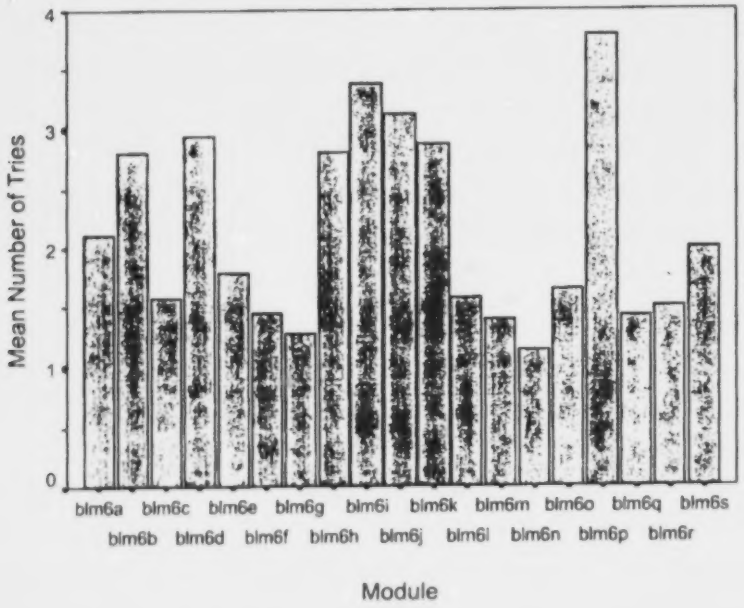

Figure 11.4: "blm6" Mean Number of Tries per Module

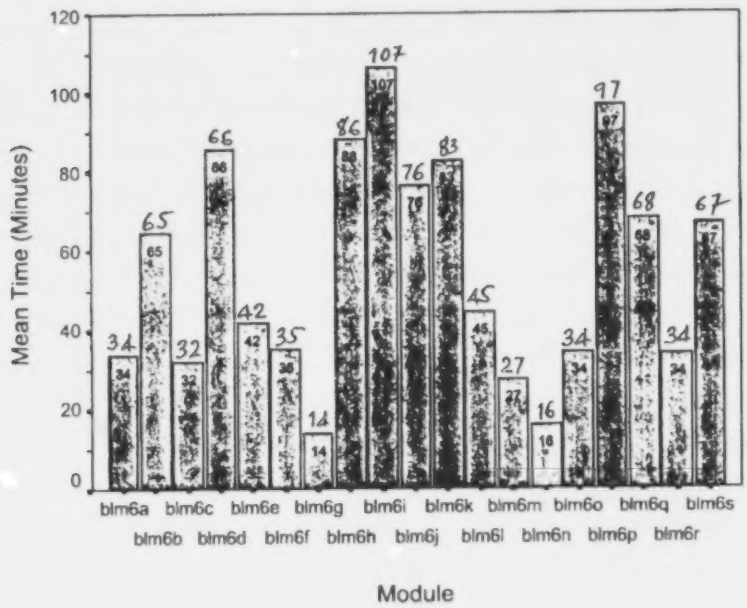

Table 12: "blm7" Course Data by Module

Module	N Started	# Completed	Mean Time	Mean Tries	# Mastered	% Mastered*
a	14	10	77.91 (58.28)	3.00 (1.55)	10	100%
b	13	10	69.50 (44.69)	2.40 (1.26)	10	100%
c	13	7	29.33 (32.22)	1.43 (0.79)	7	100%
d	12	10	54.67 (34.40)	2.78 (1.56)	10	100%
e	12	10	82.89 (59.44)	3.22 (1.86)	10	100%
f	7	6	62.40 (12.22)	3.00 (1.67)	6	100%
g	12	6	55.00 (33.89)	3.00 (2.83)	6	100%

Mean time (minutes) spent within all course modules: 253.79
Mean number of tries per course: 11.00

Figure 12.1: "blm7" Completion Status by Module

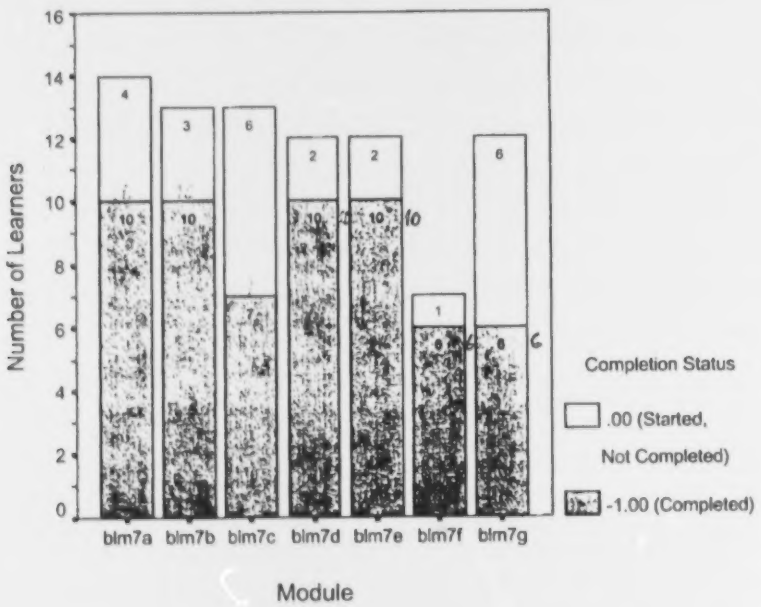

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Figure 12.2: "blm7" Activity Score by Module

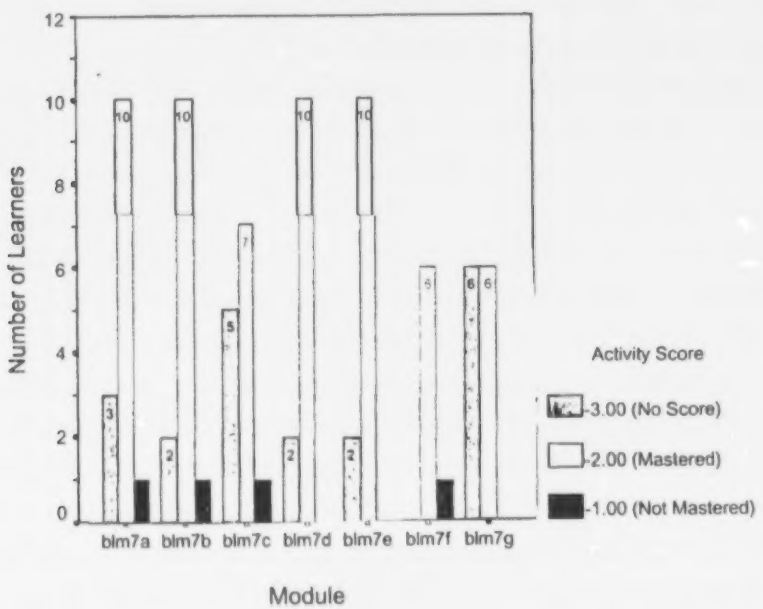

Figure 12.3: "blm7" Mean Time (Minutes) per Module

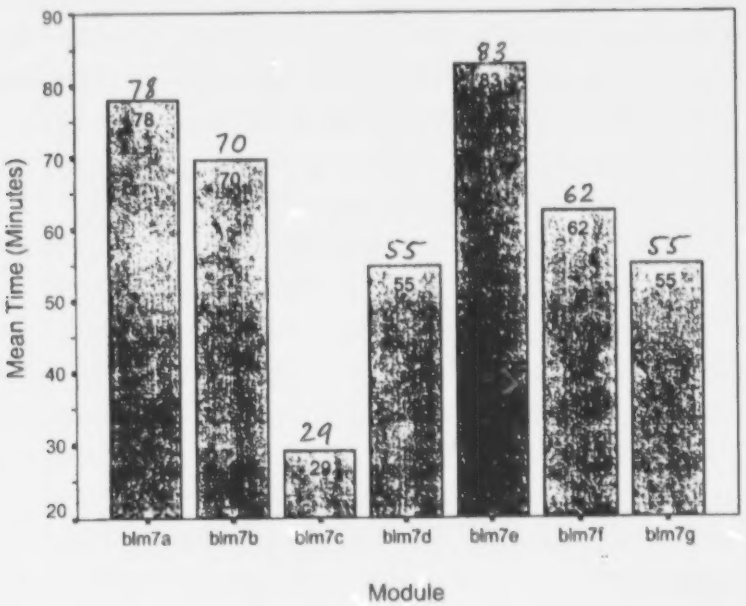

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Figure 12.4: "blm7" Mean Number of Tries per Module

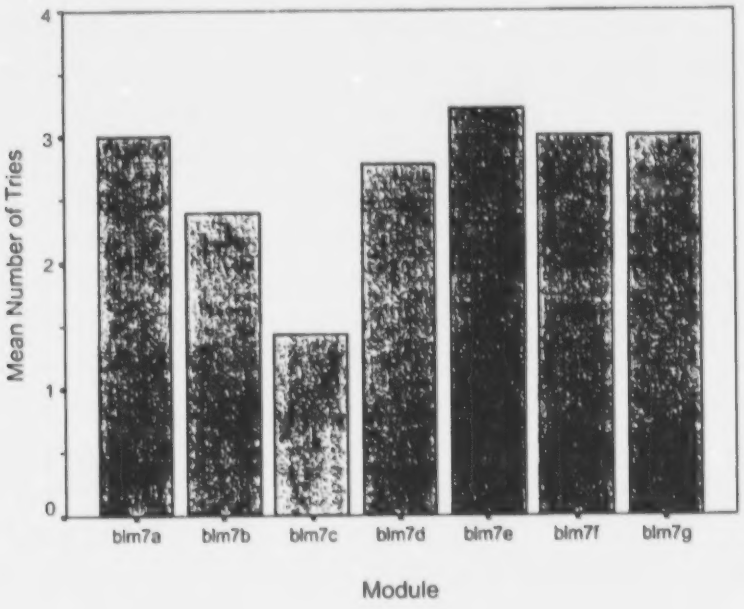

Table 13: "blm8" Course Data by Module

Module	N Started	# Completed	Mean Time	Mean Tries	# Mastered	% Mastered*
a	14	11	29.45 (20.52)	2.00 (1.61)	11	100%
b	18	11	35.47 (28.89)	1.87 (0.92)	11	100%
c	14	8	52.43 (26.92)	1.71 (1.25)	8	100%
d	14	12	50.92 (31.64)	2.42 (1.08)	12	100%
e	9	8	43.00 (19.83)	1.75 (0.71)	8	100%
f	13	9	105.44 (74.92)	3.78 (2.28)	9	100%

Mean time (minutes) spent within all course modules: 183.94
Mean number of tries per course: 8.18

Figure 13.1: "blm8" Completion Status by Module

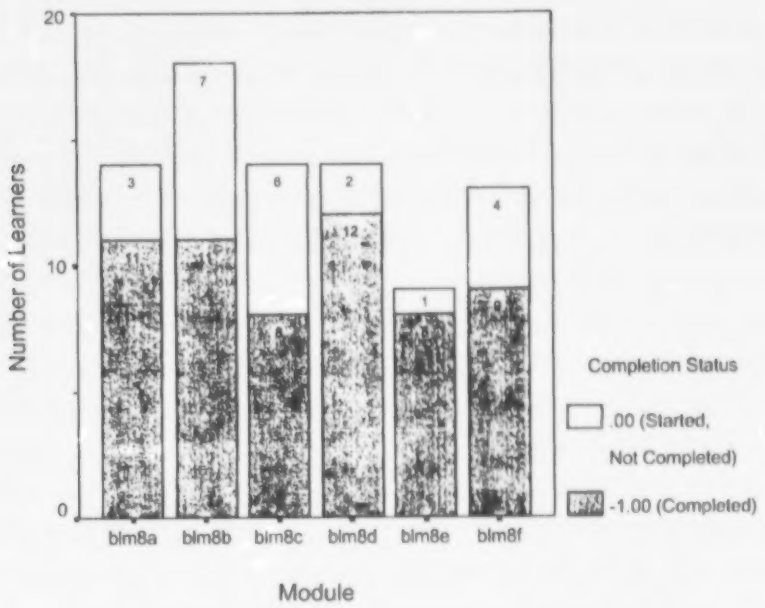

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Figure 13.2: "blm8" Activity Score by Module

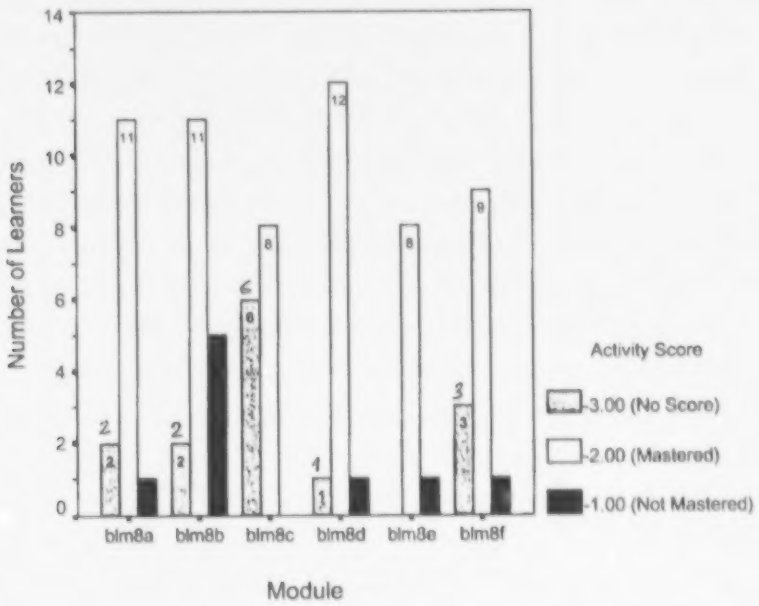

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Figure 13.3: "blm8" Mean Time (Minutes) per Module

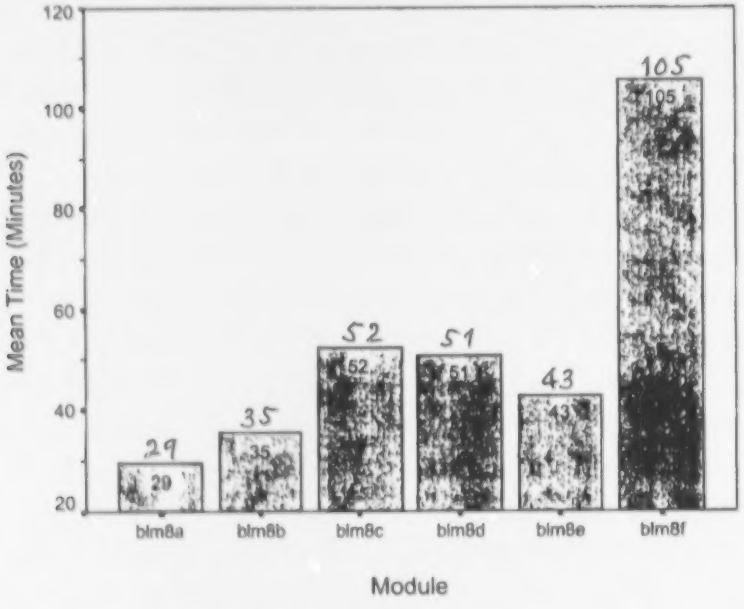

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Figure 13.4: "blm8" Mean Number of Tries per Module

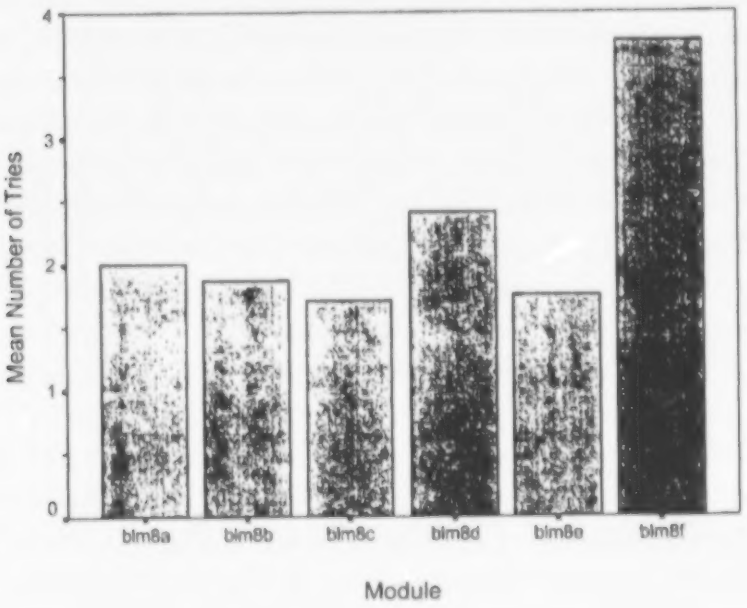

Table 14: "blm9" Course Data by Module

Module	N Started	# Completed	Mean Time	Mean Tries	# Mastered	% Mastered*
a	14	10	20.42 (13.87)	1.33 (0.65)	10	100%
b	13	11	22.40 (12.38)	1.40 (0.52)	11	100%
c	13	11	17.91 (6.12)	1.45 (0.69)	11	100%
d	15	12	17.55 (12.35)	1.18 (0.40)	12	100%
e	6	6	10.60 (2.07)	1.20 (0.45)	6	100%
f	15	11	43.38 (29.84)	1.92 (0.86)	11	100%
g	12	10	39.40 (25.91)	2.50 (1.72)	10	100%
h	12	8	8.00 (6.22)	1.00 (0.00)	8	100%
i	7	5	51.60 (22.01)	2.00 (0.63)	5	100%
j	11	9	61.22 (44.12)	1.33 (0.50)	9	100%

Mean time (minutes) spent within all course modules: 170.93
Mean number of tries per course: 9.13

Figure 14.1: "blm9" Completion Status by Module

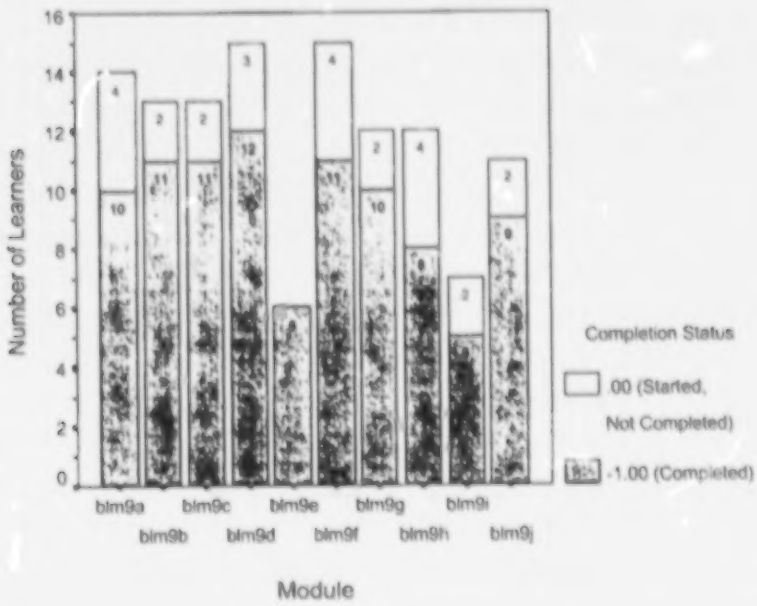

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Figure 14.2: "blm9" Activity Score by Module

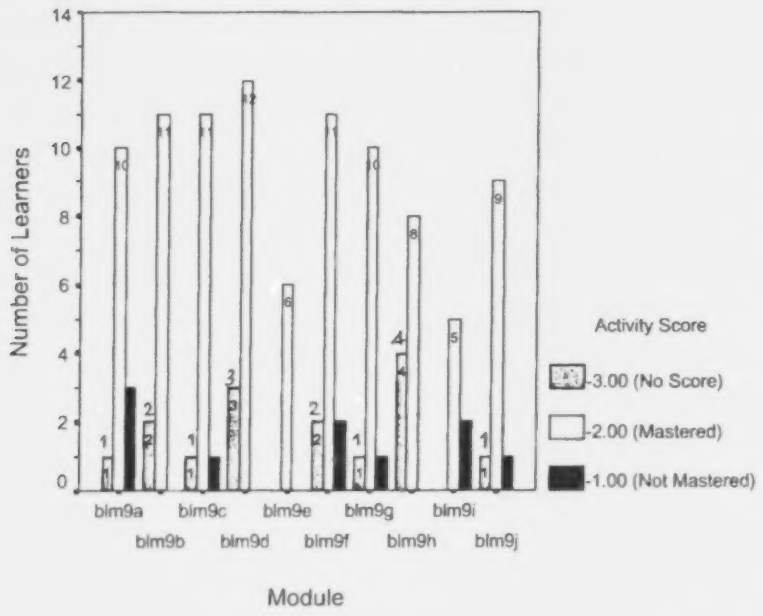

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Figure 14.3: "blm9" Mean Time (Minutes) per Module

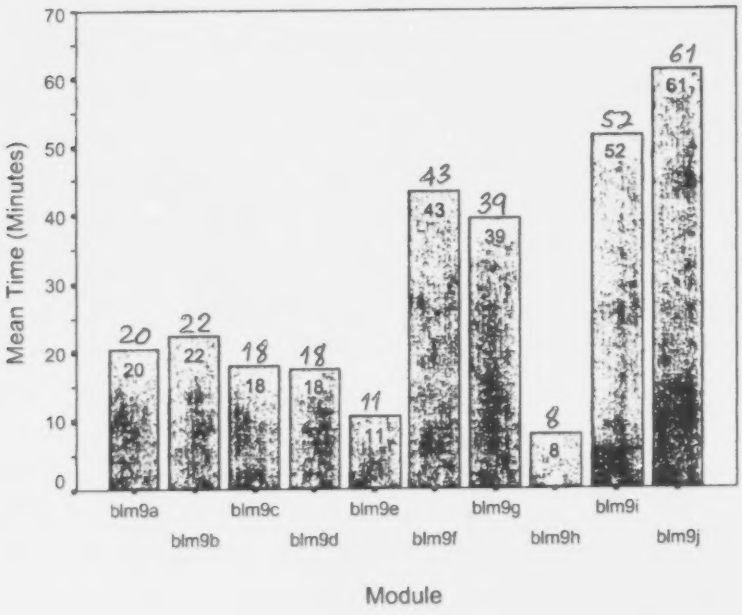

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Figure 14.4: "blm9" mean Number of Tries per Module

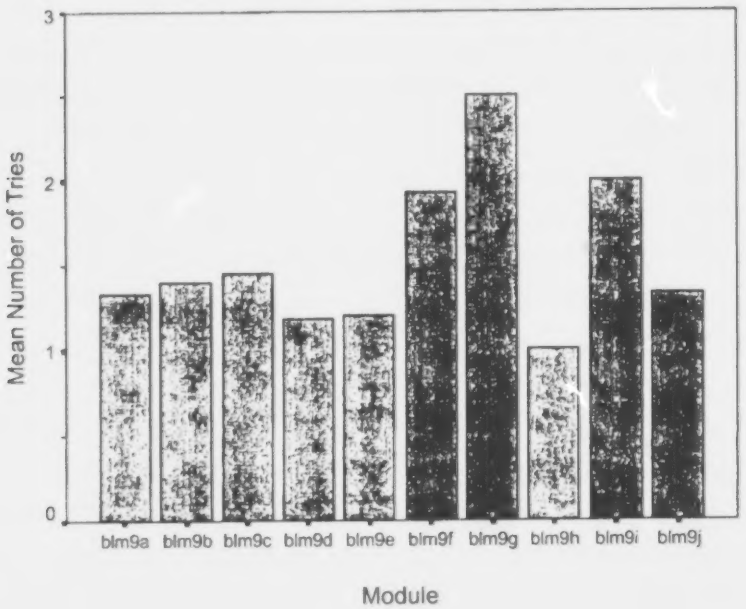

Figure 15.1: Math Fundamentals "blm" Mean Time (Minutes) per Course

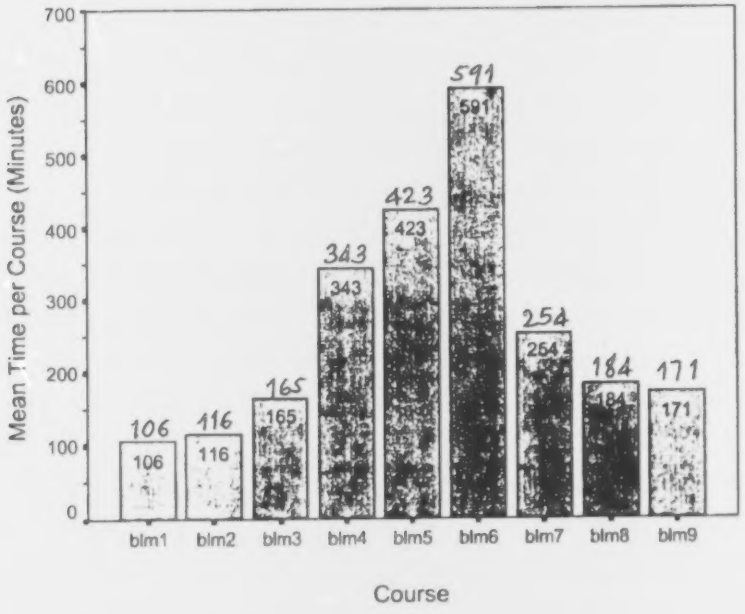

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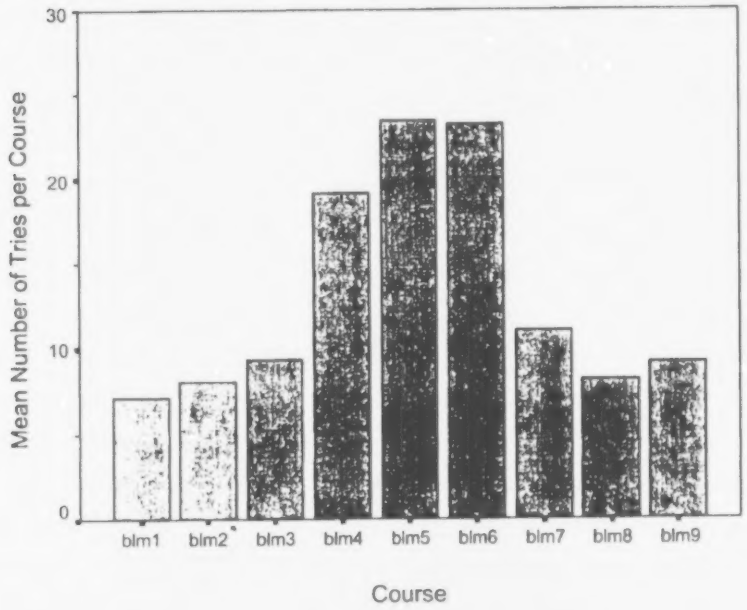
Figure 15.2: Math Fundamentals "blm" Mean Number of Tries per Course



Course: Blueprint Reading ()bpr)

Table 16: "Blueprint Reading" ()bpr) Course Data by Module

Module	N Started	# Completed	Mean Time	Mean Tries	# Mastered	% Mastered*
a	18	17	66.83 (58.34)	2.67 (2.14)	NA	NA
b	17	16	45.06 (16.62)	2.24 (0.97)	NA	NA
c	17	16	82.12 (34.51)	2.29 (1.05)	NA	NA
d	16	16	66.00 (24.20)	2.13 (1.31)	NA	NA
e	16	16	84.25 (42.60)	2.86 (1.50)	NA	NA
f	16	16	53.50 (29.80)	2.06 (1.34)	NA	NA
Total Course	**18**	**16**	**368.06**	**13.22**	**16**	**100%**

Figure 16.1: "}bpr" Completion Data by Module

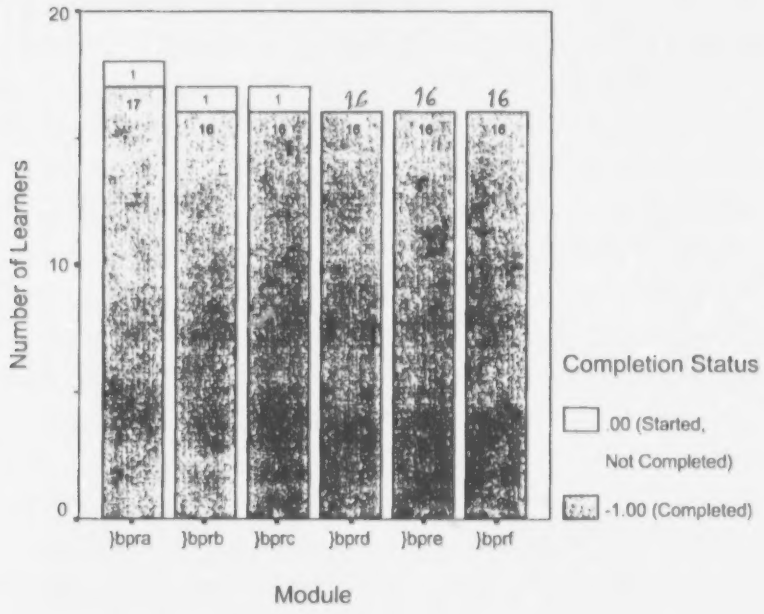


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Figure 16.2: "}bpr" Mean Time (Minutes) by Module

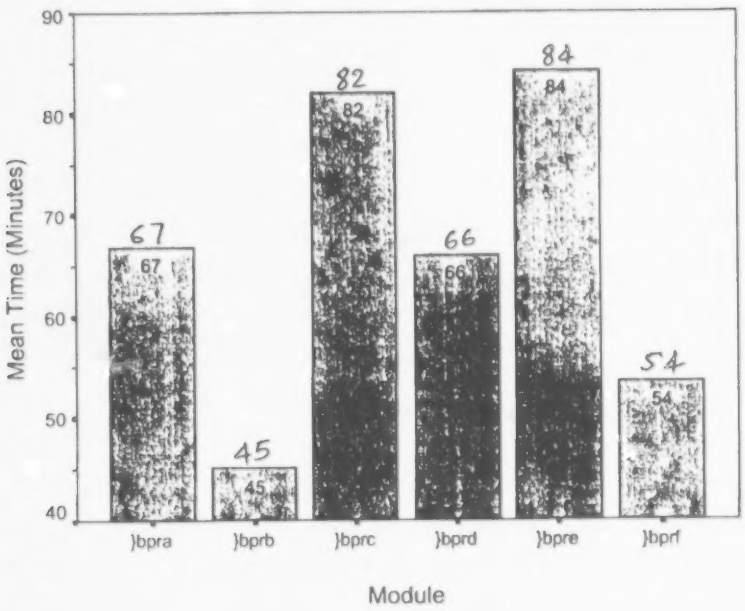
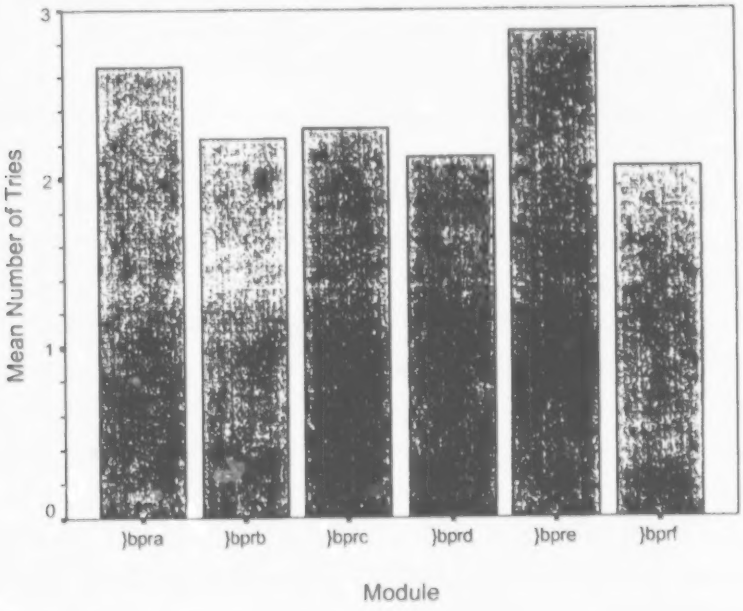


Figure 16.3: "}bpr" Mean Number of Tries per Module



Course: Hydraulics

Table 17: "Hydraulics" Course Data by Module

Module	N Started	# Completed	Mean Time	Mean Tries	# Mastered	% Mastered*
hydram 1a	16	15	115.25 (115.53)	3.31 (2.21)	15	100%
hydram 1b	15	15	45.93 (23.45)	2.47 (1.41)	15	100%
hydram 1c	15	15	102.60 (53.77)	3.47 (2.33)	15	100%
hydram 2a	16	15	127.31 (69.32)	4.44 (4.69)	15	100%
hydram 2b	15	15	107.13 (52.24)	3.07 (1.33)	15	100%
hydram 2c	15	15	178.27 (64.58)	3.60 (1.76)	15	100%
hydram 2d	15	15	43.67 (16.84)	2.20 (1.86)	15	100%
hydram 2e	15	15	50.00 (35.91)	1.87 (0.64)	15	100%
hydram 3a	15	15	71.67 (103.20)	1.87 (1.25)	15	100%
hydram 3b	15	15	20.73 (16.40)	1.53 (0.74)	15	100%
hydram 3c	15	15	15.60 (13.17)	2.07 (3.33)	15	100%
hydram 3d	19	15	73.63 (48.87)	3.26 (3.25)	15	100%
hydram 4a	15	15	34.20 (19.56)	4.07 (3.65)	15	100%
hydram 4b	16	15	31.20 (19.37)	3.44 (3.12)	15	100%
Course	**21**	**15**	**973.38**	**39.63**	**15**	**%100**

Total	

Figure 17.1: "Hydraulics" Completion Status by Module

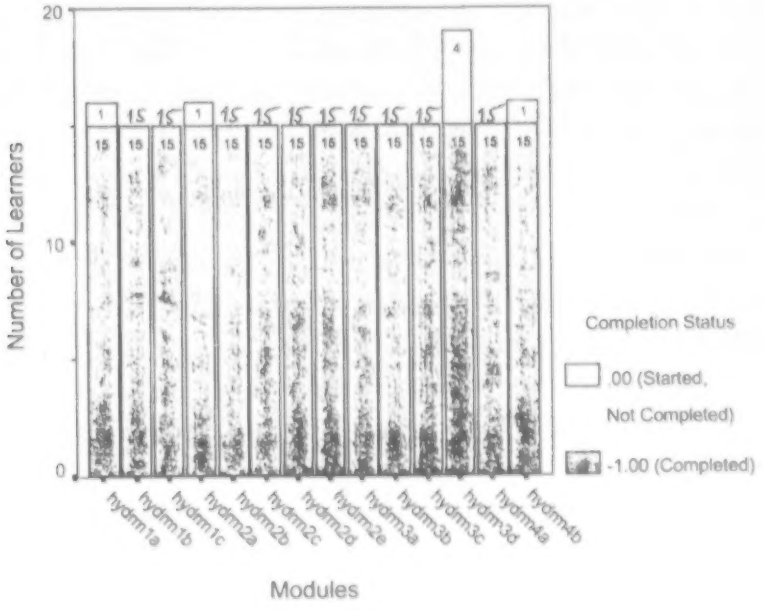


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Figure 17.2: "Hydraulics" Mean Time (Minutes) per Module

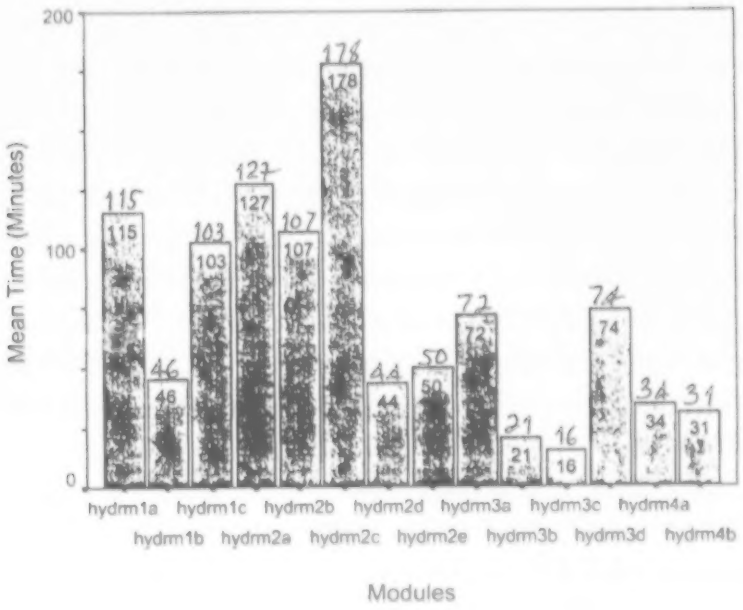
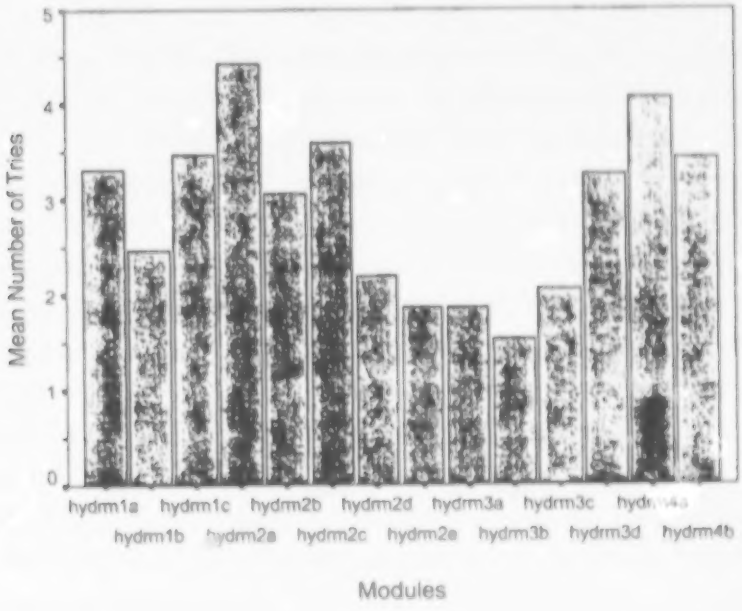


Figure 17.3: "Hydraulics" Mean Number of Tries per Module



Course: Pneumatics

Table 18: "Pneumatics" Course Data by Module

Module	N Started	# Completed	Mean Time	Mean Tries	# Mastered	% Mastered*
pneum1a	18	18	177.35 (192.84)	4.12 (5.29)	18	100%
pneum1b	18	18	60.22 (59.58)	2.06 (1.35)	18	100%
pneum2a	17	17	39.56 (26.60)	2.18 (1.33)	17	100%
pneum2b	17	17	113.82 (43.72)	2.71 (1.10)	17	100%
pneum3a	17	17	81.65 (32.84)	2.71 (1.79)	17	100%
pneum3b	17	16	103.71 (51.38)	4.00 (6.01)	16	100%
pneum3c	16	16	73.75 (39.17)	2.75 (2.72)	16	100%
pneum4a	16	16	63.50 (70.52)	3.00 (1.71)	16	100%
pneum4b	16	16	62.50 (98.37)	3.69 (4.59)	16	100%
Course	**19**	**15**	**819.06**	**11.06**	**15**	**100%**

Figure 18.1: "Pneumatics" Completion Status by Module

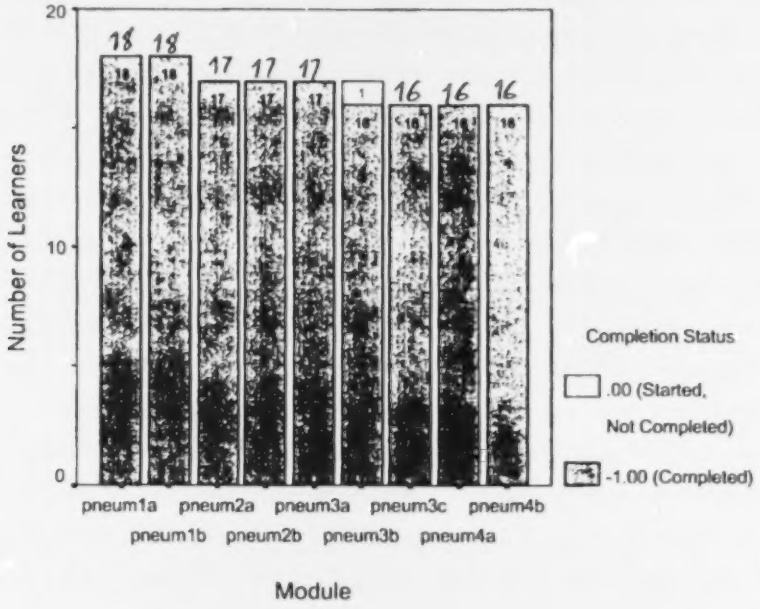


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Figure 18.2: "Pneumatics" Activity Score by Module

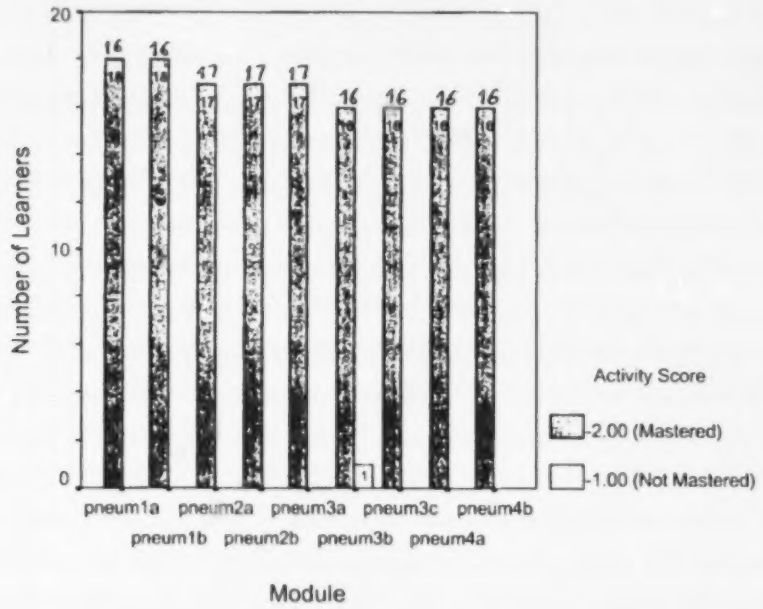

Figure 18.3: "Pneumatics" Mean Time (Minutes) per Module

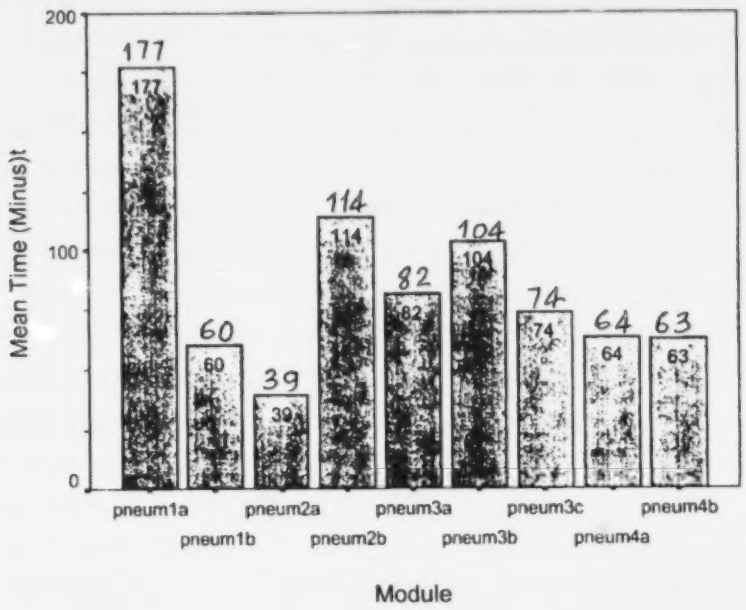

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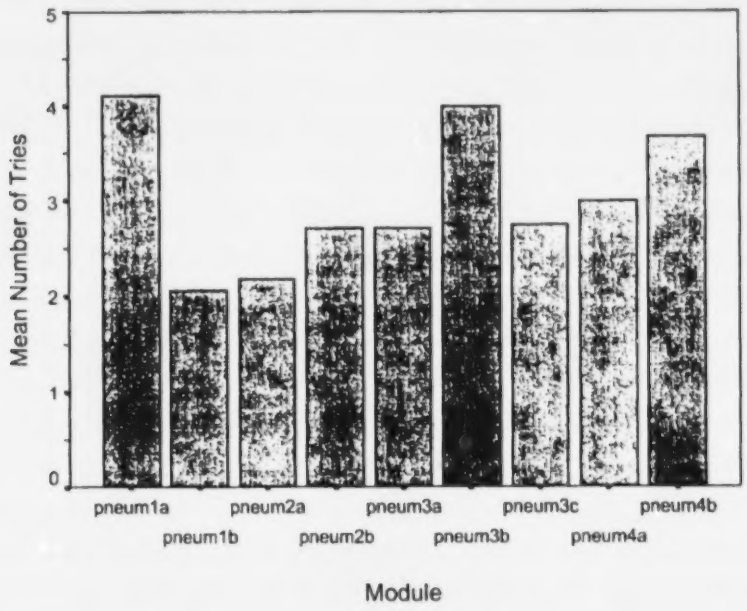
Figure 18.4: "Pneumatics" Mean Number of Tries per Module



Curriculum: Applied Math

Table 19: "Applied Math" (}wm1) Course Data by Module

Module	N Started	# Completed	Mean Time	Mean Tries	# Mastered	% Mastered*
}wm1a	13	10	144.54 (206.01)	4.15 (5.23)	10	100%
}wm1b	3	3	64.33 (27.47)	3.33 (2.52)	3	100%
}wm1c	10	10	158.80 (125.81)	5.50 (3.03)	10	100%
}wm1d	14	9	125.67 (135.23)	4.29 (4.78)	9	100%
}wm1e	3	3	89.00 (38.43)	2.33 (1.15)	3	100%
}wm1f	3	3	48.67 (6.81)	2.67 (1.53)	3	100%
}wm1g	3	3	16.00 (7.81)	1.00 (0.00)	3	100%
}wm1h	3	3	12.00 (3.00)	1.00 (0.00)	3	100%
}wm1i	3	3	47.00 (1.00)	3.00 (1.00)	3	100%
Course	**16**	**NA**	**362.88**	**13**	**NA**	**NA**

Figure 19.1: "Applied Math" ()wm1) Completion Status by Module

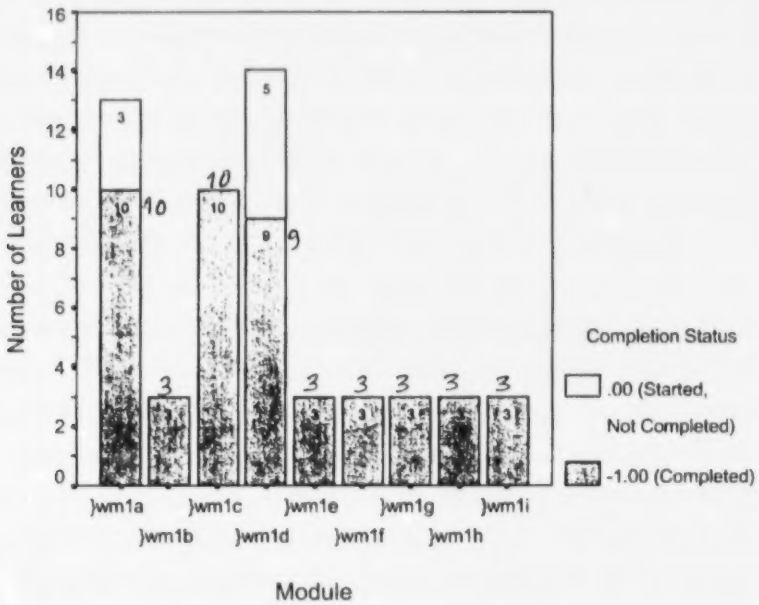


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Figure 19.2: "Applied Math" (}wm1) Activity Score by Module

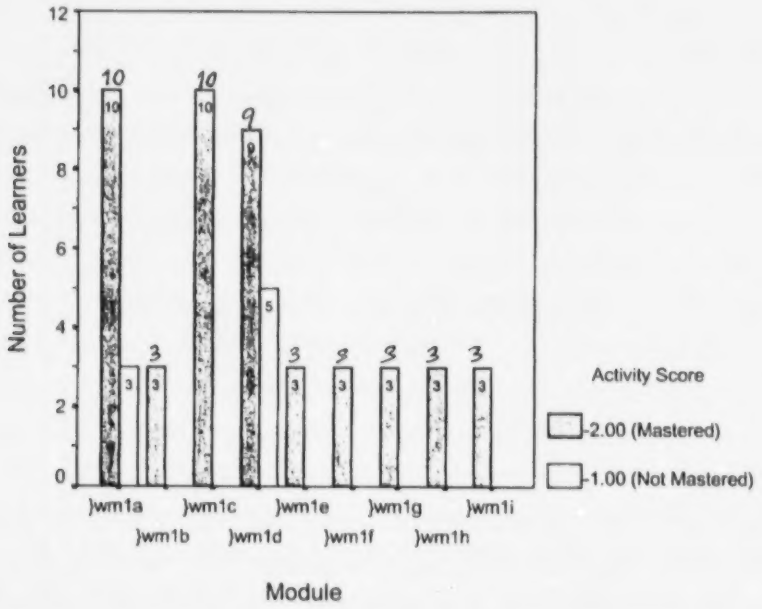

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Figure 19.3: "Applied Math" (}wm1) Mean Time (Minutes) per Module

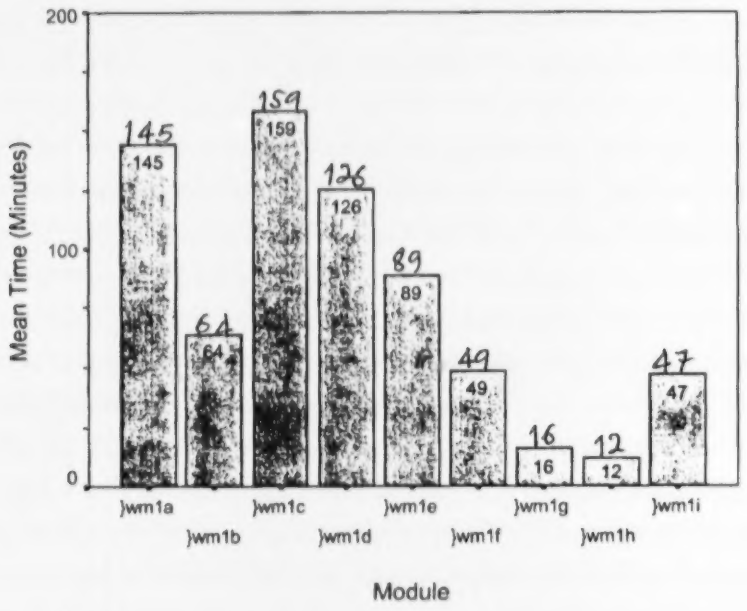

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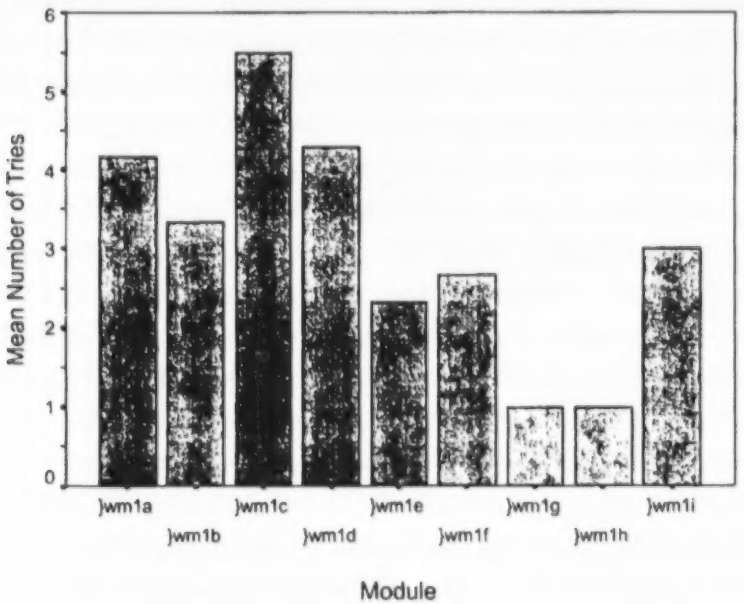
Figure 19.4: "Applied Math" (}wm1) Mean Number of Tries per Module



Curriculum: Reading 1

Table 20: "Reading 1" Curriculum Data by Course

Course	N Started	# Completed	Mean Time	Mean Tries	# Mastered	% Mastered*
blra1.1	6	2	116.00 (143.22)	4.50 (7.12)	2	100%
blra1.2	12	9	193.55 (140.76)	3.92 (3.06)	9	100%
blra2.1	2	2	185.50 (212.84)	2.50 (2.12)	2	100%
blra2.2	10	10	98.33 (56.73)	1.80 (1.93)	10	100%
blra3.1	4	3	311.00 (164.70)	4.25 (2.87)	3	100%
blra3.2	10	7	250.67 (160.70)	2.30 (1.16)	7	100%
blra4.1	9	6	191.89 (94.89)	2.44 (1.94)	6	100%
blra4.2	6	6	36.83 (22.36)	1.67 (1.63)	6	100%
blra5	6	6	245.50 (126.77)	4.33 (2.80)	6	100%
Total	**16**	**NA**	**687.63**	**12.19**	**NA**	**NA**

Figure 20.1: "Reading 1" Completion Status by Course

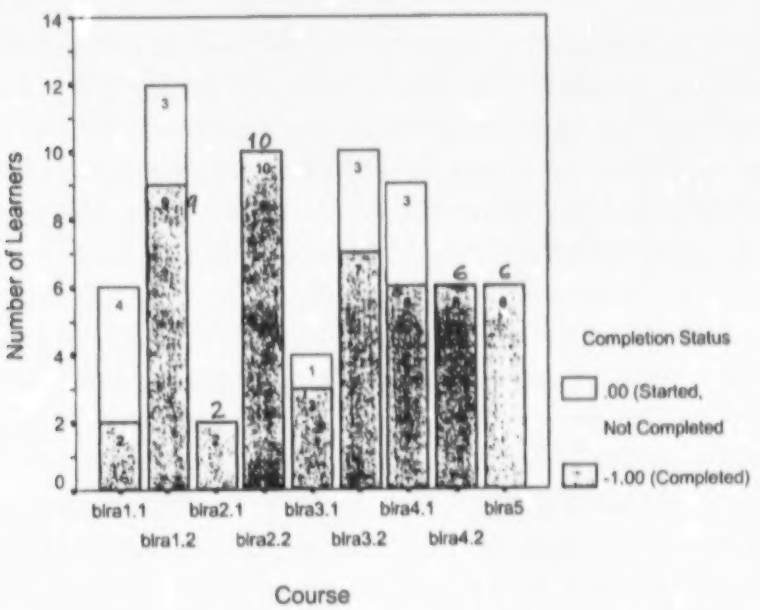


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Figure 20.2: "Reading 1" Activity Score by Course

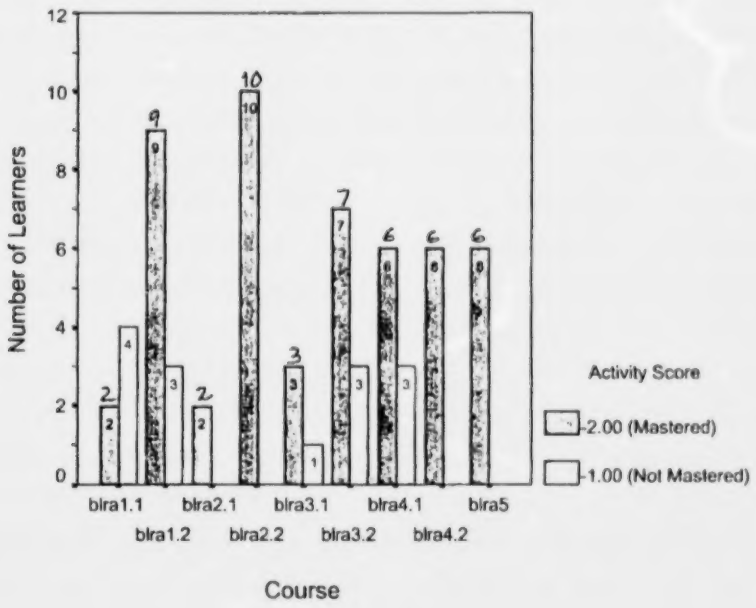

Figure 20.3: "Reading 1" Mean Time (Minutes) per Course

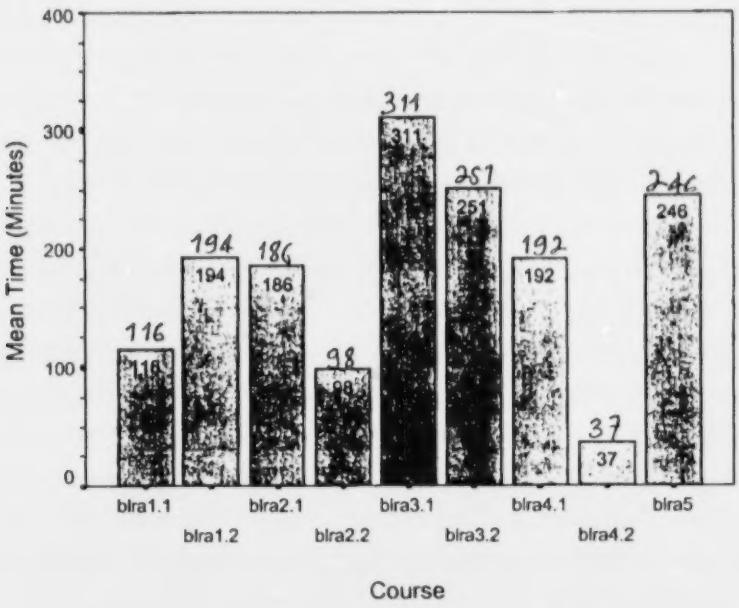

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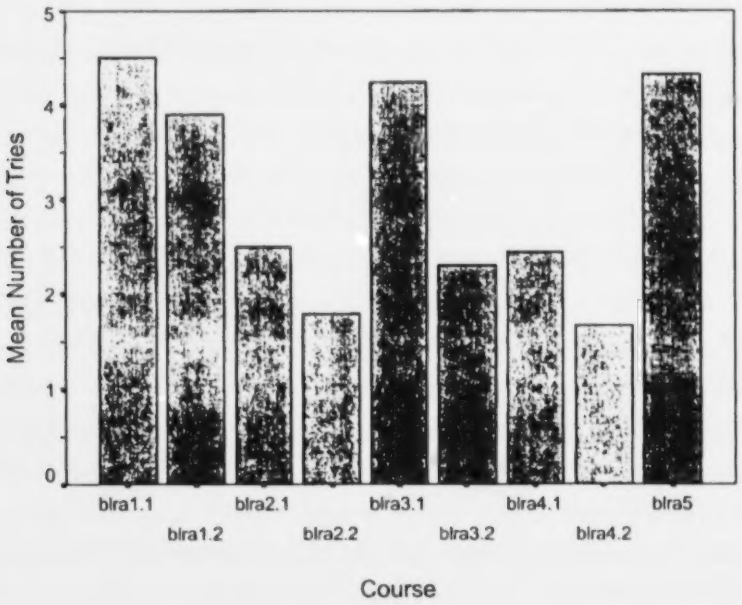
Figure 20.4: "Reading 1" Mean Number of Tries per Course



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